GA-Z87X-UD5 TH

User's Manual

Rev. 1101

12ME-Z87UD5T-1101R

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GMbH

Address: **Bullenkoppel 16, 22047 Hamburg, Germany**

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-Z87X-UD5 TH**

conforms with the essential requirements of the following directives:

☒ **2004/108/EC EMC Directive:**

☒ Conduction & Radiated Emissions:	EN 55022:2010
☒ Immunity:	EN 55024:2010
☒ Power-line harmonics:	EN 61000-3-2:2006+A2:2009
☒ Power-line flicker:	EN 61000-3-3:2008

☒ **2006/95/EC LVD Directive**

☒ Safety:	EN 60950-1:2006/A12:2011

☒ **1999/5/EC R&TTE Directive**

☒ Technical Requirements:	EN 300 328 v1.7.1 EN 301 489-1 V1.9.2, EN 301 489-17 v2.1.1

☒ **2011/65/EU RoHS Directive**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

Signature: Timmy Huang

(Stamp)

Date: Aug. 16, 2013

Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

Responsible Party Name: **G.B.T. INC. (U.S.A.)**

Address: **17358 Railroad Street**
City of Industry, CA 91748

Phone/Fax No: **(626) 854-9338/ (626) 854-9326**

hereby declares that the product

Product Name: **Motherboard**

Model Number: GA-Z87X-UD5 TH

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Aug. 16, 2013

Wireless Module Country Approvals:

United States FCC: QDS-BRCM1073 Canada IC: 4324A-BRCM1073	European Union CE0560 ⓘ	Singapore Complies with IDA Standards DA104328
Australia & New-Zealand N27204	Indonesia XXXXX/SDPPI/2013 1921	South Africa TA-2013/XXX ICASA APPROVED
Brazil ANATEL Agência Nacional de Telecomunicações 1178-13-1869 (01) 07898581340065 Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.	Japan R 13215118/AA/00 T 13225021/AA/00	South Korea KCC-CRM-BCM-1073
	Mexico COFETEL No. RCPBRBC13-XXXX	Taiwan CCAF13LP0550T1
	Pakistan Approved by PTA PTA Pakistan Telecom Authority	
China CMIIT ID: 2013DJXXXX		

See the latest safety and regulatory documents at GIGABYTE's website.

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Documentation Classifications

In order to assist in the use of this product, GIGABYTE provides the following types of documentations:

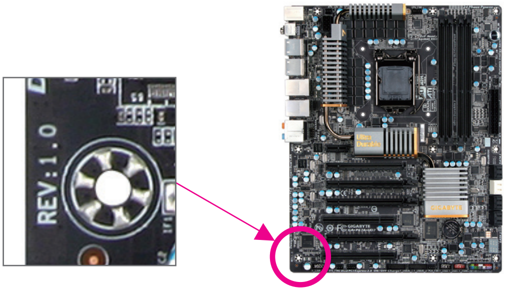
- For quick set-up of the product, read the Quick Installation Guide included with the product.
- For detailed product information, carefully read the User's Manual.

For product-related information, check on our website at: http://www.gigabyte.com

Identifying Your Motherboard Revision

The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information.

Example:



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Box Contents

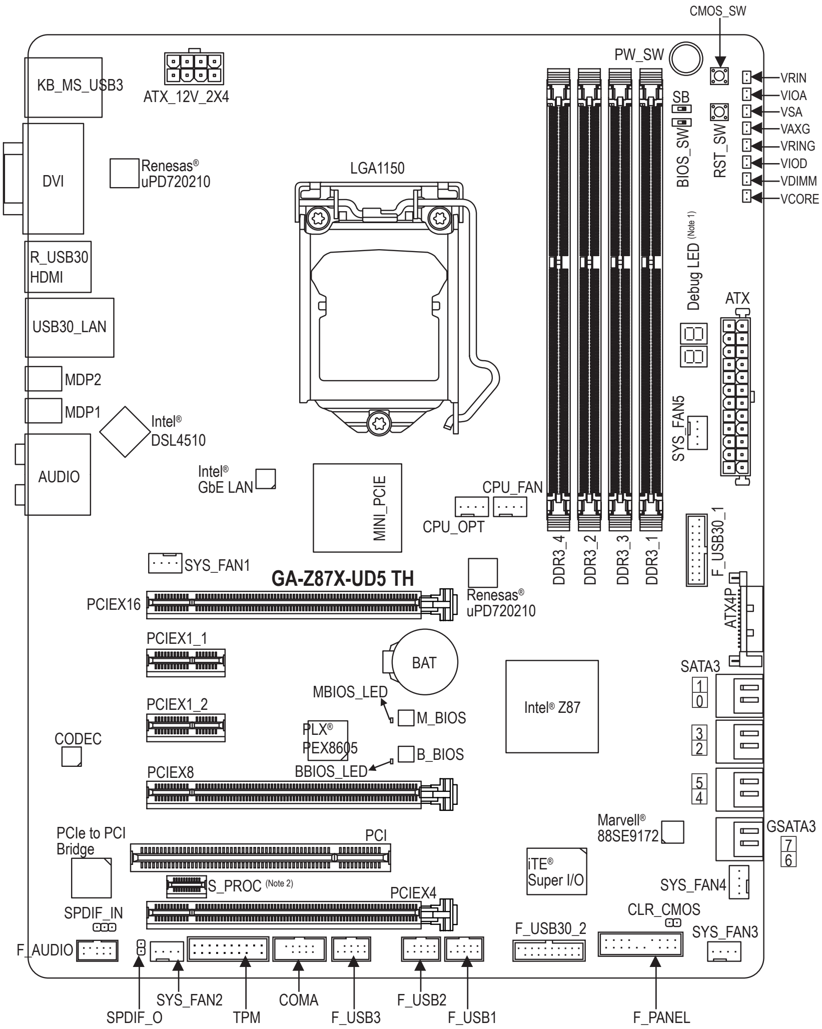
- ☑ GA-Z87X-UD5 TH motherboard
- ☑ Motherboard driver disk
- ☑ Wireless module driver disk
- ☑ User's Manual
- ☑ Quick Installation Guide
- ☑ Six SATA cables
- ☑ I/O Shield
- ☑ 3.5" Front Panel with 2 USB 3.0/2.0 ports
- ☑ One 2-Way SLI bridge connector
- ☑ One antenna

The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.

Optional Items

- ☐ 2-port USB 2.0 bracket (Part No. 12CR1-1UB030-6*R)
- ☐ eSATA bracket (Part No. 12CF1-3SATPW-4*R)
- ☐ 3.5" Front Panel with 2 USB 3.0/2.0 ports (Part No. 12CR1-FPX582-2*R)
- ☐ S/PDIF In cable (Part No. 12CR1-1SPDIN-1*R)
- ☐ HDMI-to-DVI adapter (Part No. 12CT2-HDMI01-1*R)
- ☐ COM port cable (Part No. 12CF1-1CM001-3*R)

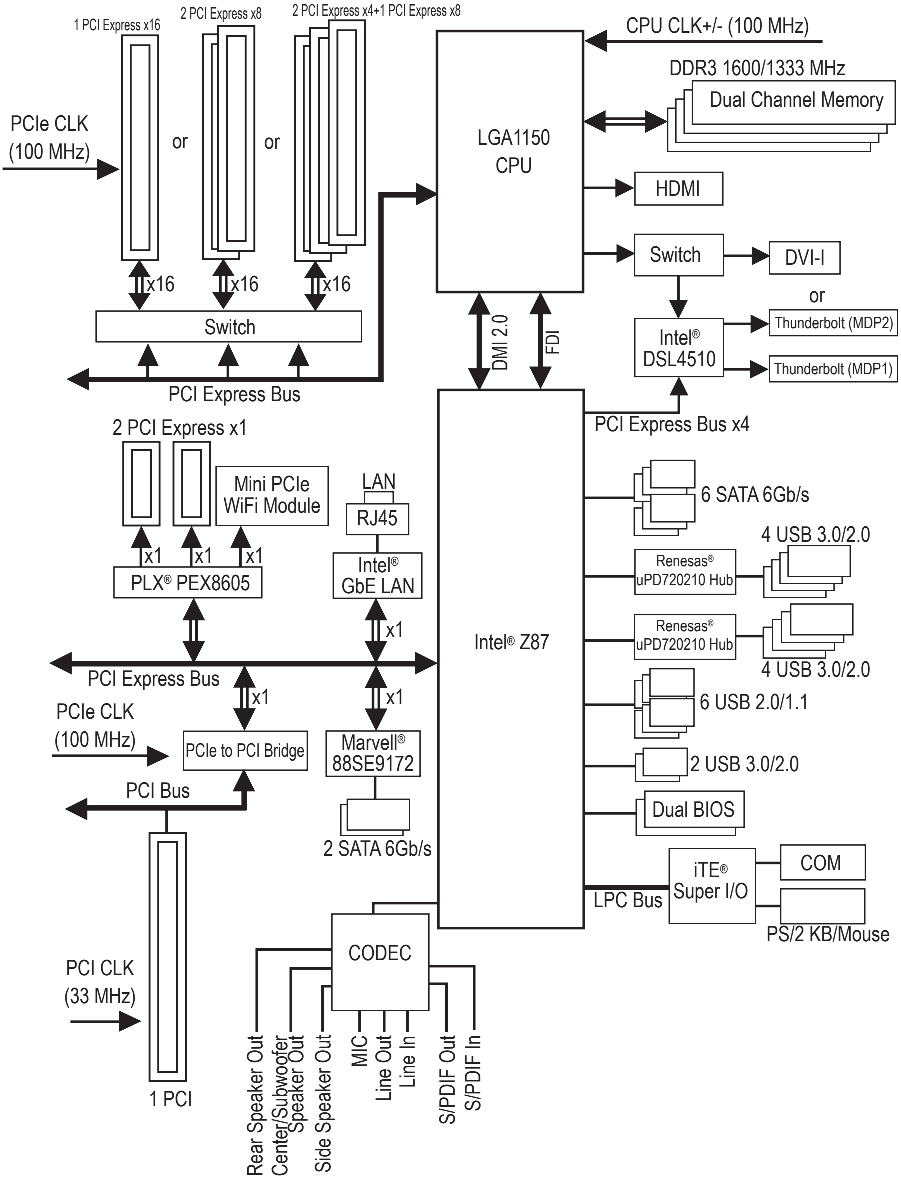
GA-Z87X-UD5 TH Motherboard Layout


CMOS_SW
PW_SW
KB_MS_USB3
ATX_12V_2X4
VRIN
VIOA
VSA
VAXG
VRING
VIOD
VDIMM
VCORE
SB
BIOS_SW
RST_SW
DVI
Renesas®
uPD720210
LGA1150
Debug LED (Note 1)
R_USB30
HDMI
USB30_LAN
ATX
MDP2
MDP1
Intel®
DSL4510
SYS_FAN5
AUDIO
Intel®
GbE LAN
MINI_PCIE
CPU_FAN
CPU_OPT
DDR3_4
DDR3_2
DDR3_3
DDR3_1
F_USB30_1
SYS_FAN1
GA-Z87X-UD5 TH
PCIEX16
Renesas®
uPD720210
ATX4P
PCIEX1_1
BAT
SATA3
1
0
MBIOS_LED
Intel® Z87
PCIEX1_2
M_BIOS
3
2
CODEC
PLX®
PEX8605
B_BIOS
BBIOS_LED
PCIEX8
5
4
Marvell®
88SE9172
PCIe to PCI
Bridge
PCI
GSATA3
7
6
iTE®
Super I/O
S_PROC (Note 2)
SYS_FAN4
PCIEX4
SPDIF_IN
CLR_CMOS
F_USB30_2
SYS_FAN3
F_AUDIO
SPDIF_O
SYS_FAN2
TPM
COMA
F_USB3
F_USB2
F_USB1
F_PANEL

(Note 1) For debug code information, please refer to Chapter 6.

(Note 2) The slot is for future expansion only.

GA-Z87X-UD5 TH Motherboard Block Diagram


1 PCI Express x16
2 PCI Express x8
2 PCI Express x4+1 PCI Express x8
PCIe CLK
(100 MHz)
or
or
x16
x16
x16
Switch
PCI Express Bus
LGA1150
CPU
CPU CLK+/- (100 MHz)
DDR3 1600/1333 MHz
Dual Channel Memory
HDMI
Switch
DVI-I
or
Intel®
DSL4510
Thunderbolt (MDP2)
Thunderbolt (MDP1)
DMI 2.0
FDI
PCI Express Bus x4
2 PCI Express x1
Mini PCIe
WiFi Module
LAN
RJ45
x1
x1
x1
PLX® PEX8605
Intel®
GbE LAN
x1
Intel® Z87
PCI Express Bus
x1
x1
PCIe CLK
(100 MHz)
PCIe to PCI Bridge
Marvell®
88SE9172
PCI Bus
2 SATA 6Gb/s
6 SATA 6Gb/s
4 USB 3.0/2.0
Renesas®
uPD720210 Hub
Renesas®
uPD720210 Hub
4 USB 3.0/2.0
6 USB 2.0/1.1
2 USB 3.0/2.0
Dual BIOS
iTE®
Super I/O
COM
PS/2 KB/Mouse
LPC Bus
CODEC
PCI CLK
(33 MHz)
1 PCI
Rear Speaker Out
Center/Subwoofer
Speaker Out
Side Speaker Out
MIC
Line Out
Line In
S/PDIF Out
S/PDIF In

For detailed product information/limitation(s), refer to "1-2 Product Specifications."

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, make sure the chassis is suitable for the motherboard.
- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications

CPU	◆ Support for Intel® Core™ i7 processors/Intel® Core™ i5 processors/ Intel® Core™ i3 processors/Intel® Pentium® processors/ Intel® Celeron® processors in the LGA1150 package (Go to GIGABYTE's website for the latest CPU support list.) ◆ L3 cache varies with CPU
Chipset	◆ Intel® Z87 Express Chipset
Memory	◆ 4 x 1.5V DDR3 DIMM sockets supporting up to 32 GB of system memory * Due to a Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than the size of the physical memory installed. ◆ Dual channel memory architecture ◆ Support for DDR3 1600/1333 MHz memory modules ◆ Support for non-ECC memory modules ◆ Support for Extreme Memory Profile (XMP) memory modules (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
Onboard Graphics	◆ Integrated Graphics Processor: - 1 x DVI-I port, supporting a maximum resolution of 1920x1200 - 1 x HDMI port, supporting a maximum resolution of 4096x2160 * Support for HDMI 1.4a version. - Maximum shared memory of 1 GB ◆ Intel® DSL4510 chip: - 2 Thunderbolt ports (MDP1/MDP2) support for Mini-DisplayPort and Thunderbolt monitor(s), and supporting a maximum resolution of 2560x1600. * If a monitor is connected to the MDP2 Thunderbolt port , the DVI-I port will become unavailable. * Because of the limited I/O resources of the PC architecture, the number of Thunderbolt devices that can be used is dependent on the number of the PCI Express and PCI devices being installed. (Refer to Chapter 1-7, "Back Panel Connectors," and Chapter 2, "Peripherals\Intel(R) Thunderbolt" for more information.)
Audio	◆ Realtek® ALC898 codec ◆ Support for X-Fi Xtreme Fidelity® and EAX® Advanced HD™ 5.0 technologies ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel ◆ Support for S/PDIF In/Out
LAN	◆ Intel® GbE LAN chip (10/100/1000 Mbit)
Wireless Communication module	◆ Wi-Fi 802.11 a/b/g/n/ac, supporting 2.4/5 GHz Dual-Band ◆ Bluetooth 4.0, 3.0+HS, 2.1+EDR ◆ Support for 11ac wireless standard and up to 867 Mbps data rate. * Actual data rate may vary depending on environment and equipment.
Expansion Slots	◆ 1 x PCI Express x16 slot, running at x16 (PCIEX16) * For optimum performance, if only one PCI Express graphics card is to be installed, be sure to install it in the PCIEX16 slot. ◆ 1 x PCI Express x16 slot, running at x8 (PCIEX8) * The PCIEX8 slot shares bandwidth with the PCIEX16 slot. When the PCIEX8 slot is populated, the PCIEX16 slot will operate at up to x8 mode.

Expansion Slots	◆ 1 x PCI Express x16 slot, running at x4 (PCIEX4) * The PCIEX4 slot shares bandwidth with the PCIEX8 and PCIEX16 slots. When the PCIEX4 slot is populated, the PCIEX16 slot will operate at up to x8 mode and the PCIEX8 will operate at up to x4 mode. * When installing a x8 or above card in the PCIEX4 slot, make sure to set **PCIE Slot Configuration** in BIOS Setup to **x4**. (Refer to Chapter 2, "BIOS Setup," "Peripherals," for more information.) (The PCI Express x16 slots conform to PCI Express 3.0 standard.) ◆ 2 x PCI Express x1 slots (The PCI Express x1 slots conform to PCI Express 2.0 standard.) ◆ 1 x PCI slot ◆ 1 x mini-PCI Express slot for the wireless communication module
Multi-Graphics Technology	◆ Support for 2-Way AMD CrossFire™/2-Way NVIDIA® SLI™ technology
Storage Interface	◆ Chipset: - 6 x SATA 6Gb/s connectors (SATA3 0~5) - Support for RAID 0, RAID 1, RAID 5, and RAID 10 ◆ Marvell® 88SE9172 chip: - 2 x SATA 6Gb/s connectors (GSATA3 6~7) - Support for RAID 0 and RAID 1
USB	◆ Chipset: - 2 x USB 3.0/2.0 ports (available through the internal USB header) - 6 x USB 2.0/1.1 ports (available through the internal USB headers) ◆ Chipset + 2 Renesas® uPD720210 USB 3.0 Hubs: - 8 x USB 3.0/2.0 ports (6 ports on the back panel, 2 ports available through the internal USB header)
Internal Connectors	◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 1 x PCIe power connector ◆ 8 x SATA 6Gb/s connectors ◆ 1 x CPU fan header ◆ 1 x water cooling fan header (CPU_OPT) ◆ 5 x system fan headers ◆ 1 x front panel header ◆ 1 x front panel audio header ◆ 1 x S/PDIF In header ◆ 1 x S/PDIF Out header ◆ 2 x USB 3.0/2.0 headers ◆ 3 x USB 2.0/1.1 headers ◆ 1 x serial port header ◆ 1 x Clear CMOS jumper ◆ 1 x Trusted Platform Module (TPM) header ◆ 1 x power button ◆ 1 x reset button ◆ 1 x Clear CMOS button ◆ 2 x BIOS switches ◆ Voltage measurement points

Back Panel Connectors	◆ 1 x PS/2 keyboard/mouse port ◆ 1 x DVI-I port ◆ 1 x HDMI port ◆ 2 x antenna connectors ◆ 2 x Thunderbolt ports ◆ 1 x optical S/PDIF Out connector ◆ 6 x USB 3.0/2.0 ports ◆ 1 x RJ-45 port ◆ 5 x audio jacks (Center/Subwoofer Speaker Out, Rear Speaker Out, Line In, Line Out, Mic In)
I/O Controller	◆ iTE® I/O Controller Chip
Hardware Monitor	◆ System voltage detection ◆ CPU/System/Chipset temperature detection ◆ CPU/CPU OPT/System fan speed detection ◆ CPU/System overheating warning ◆ CPU/CPU OPT/System fan fail warning ◆ CPU/CPU OPT/System fan speed control * Whether the fan speed control function is supported will depend on the cooler you install.
BIOS	◆ 2 x 128 Mbit flash ◆ Use of licensed AMI EFI BIOS ◆ Support for DualBIOS™ ◆ PnP 1.0a, DMI 2.0, SM BIOS 2.6, ACPI 2.0a
Unique Features	◆ Support for Q-Flash ◆ Support for Xpress Install ◆ Support for APP Center * Available applications in APP Center may differ by motherboard model. Supported functions of each application may also differ depending on motherboard specifications. - @BIOS - EasyTune - EZ Setup - ON/OFF Charge2 - USB Blocker - Smart TimeLock - Smart Recovery 2
Bundled Software	◆ Norton® Internet Security (OEM version) ◆ Intel® Rapid Start Technology ◆ Intel® Smart Connect Technology ◆ Intel® Smart Response Technology ◆ Intel® Wireless Display ◆ cFosSpeed
Operating System	◆ Support for Windows 8.1/8/7 * If you plan to install Windows 8.1, please download the latest drivers from GIGABYTE's website.
Form Factor	◆ ATX Form Factor; 30.5cm x 24.4cm

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

* Please visit the **Support & Downloads\Utility** page on GIGABYTE's website to check the supported operating system(s) for the software listed in the "Unique Features" and "Bundled Software" columns.

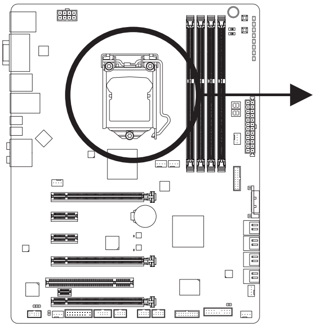
1-3 Installing the CPU and CPU Cooler

Read the following guidelines before you begin to install the CPU:

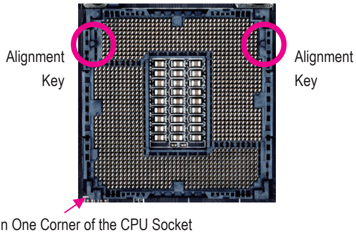
- Make sure that the motherboard supports the CPU.
  (Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

1-3-1 Installing the CPU

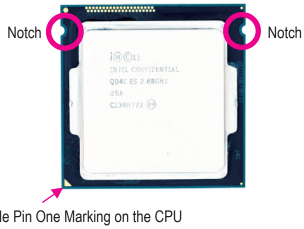
A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



LGA1150 CPU Socket

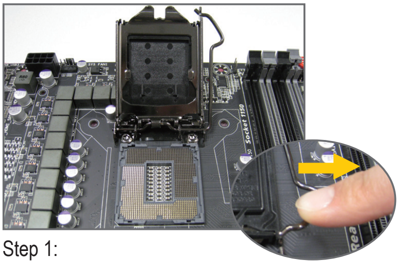


LGA1150 CPU

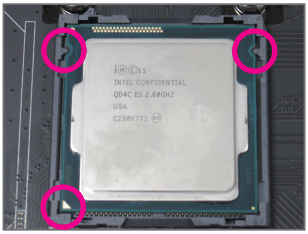


B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.

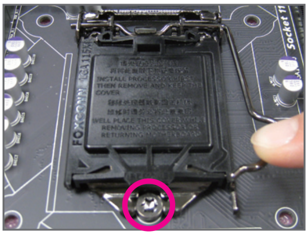
- **Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.**
- **To protect the socket contacts, do not remove the protective plastic cover unless the CPU is inserted into the CPU socket. Save the cover properly and replace it if the CPU is removed.**



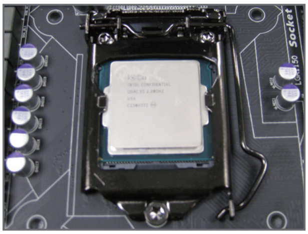
Step 1:
Gently press the CPU socket lever handle down and away from the socket with your finger. Then completely lift the CPU socket lever and the metal load plate/plastic cover will be lifted as well.



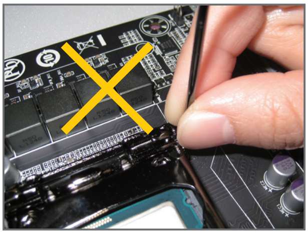
Step 2:
Hold the CPU with your thumb and index fingers. Align the CPU pin one marking (triangle) with the pin one corner of the CPU socket (or you may align the CPU notches with the socket alignment keys) and gently insert the CPU into position.



Step 3:
Once the CPU is properly inserted, carefully replace the load plate. When replacing the load plate, make sure the front end of the load plate is under the shoulder screw. Then press the CPU socket lever. The protective plastic cover may pop off from the load plate during the process of engaging the lever. Remove the cover. (Save the cover properly and always replace it when the CPU is not installed.)



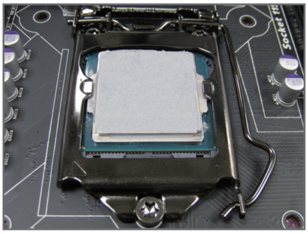
Step 4:
Finally, secure the lever under its retention tab to complete the installation of the CPU.



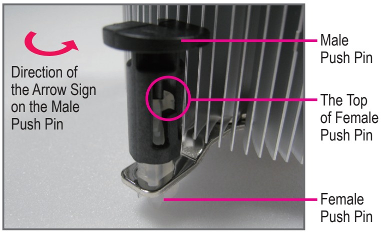
NOTE:
Hold the CPU socket lever by the handle, not the lever base portion.

1-3-2 Installing the CPU Cooler

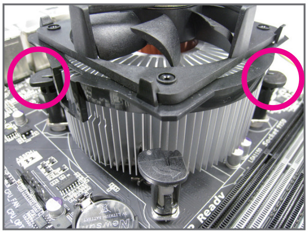
Follow the steps below to correctly install the CPU cooler on the motherboard. (The following procedure uses Intel® boxed cooler as the example cooler.)



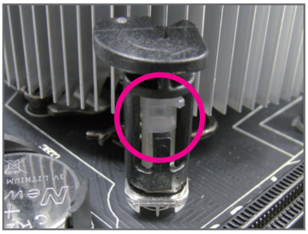
Step 1:
Apply an even and thin layer of thermal grease on the surface of the installed CPU.



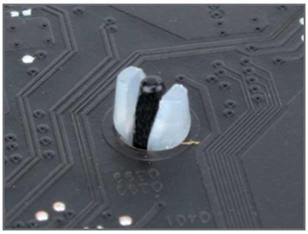
Step 2:
Before installing the cooler, note the direction of the arrow sign ↪ on the male push pin. (Turning the push pin along the direction of arrow is to remove the cooler, on the contrary, is to install.)



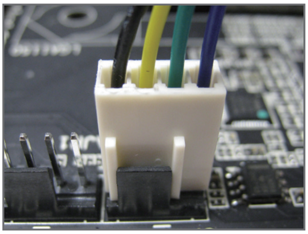
Step 3:
Place the cooler atop the CPU, aligning the four push pins through the pin holes on the motherboard. Push down on the push pins diagonally.



Step 4:
You should hear a "click" when pushing down each push pin. Check that the Male and Female push pins are joined closely. (Refer to your CPU cooler installation manual for instructions on installing the cooler.)



Step 5:
After the installation, check the back of the motherboard. If the push pin is inserted as the picture above shows, the installation is complete.



Step 6:
Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard.

Use extreme care when removing the CPU cooler because the thermal grease/tape between the CPU cooler and CPU may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU.

1-4 Installing the Memory

Read the following guidelines before you begin to install the memory:

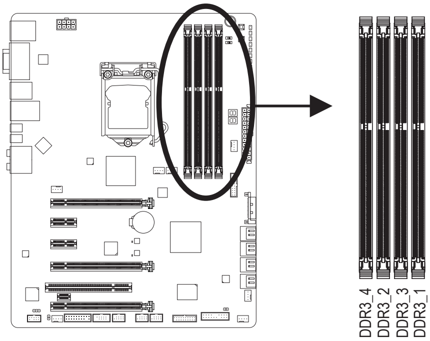
- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
  (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

1-4-1 Dual Channel Memory Configuration

This motherboard provides four DDR3 memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

The four DDR3 memory sockets are divided into two channels and each channel has two memory sockets as following:

- ⏩ Channel A: DDR3_2, DDR3_4
- ⏩ Channel B: DDR3_1, DDR3_3



⏩ Dual Channel Memory Configurations Table

	DDR3_4	DDR3_2	DDR3_3	DDR3_1
Two Modules	- -	DS/SS	- -	DS/SS
	DS/SS	- -	DS/SS	- -
Four Modules	DS/SS	DS/SS	DS/SS	DS/SS

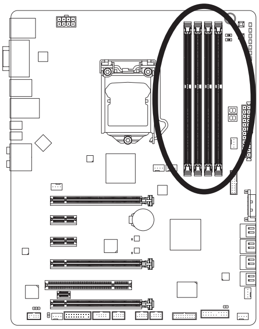
(SS=Single-Sided, DS=Double-Sided, "- -"=No Memory)

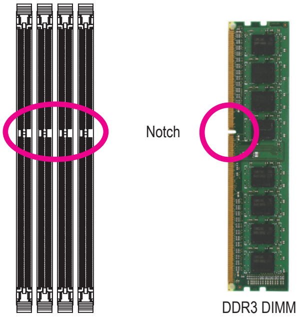
Due to CPU limitations, read the following guidelines before installing the memory in Dual Channel mode.

1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed.
2. When enabling Dual Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used and installed in the same colored DDR3 sockets. For optimum performance, when enabling Dual Channel mode with two memory modules, we recommend that you install them in the DDR3_1 and DDR3_2 sockets.

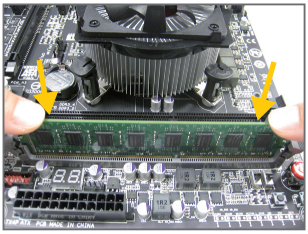
1-4-2 Installing a Memory

Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. DDR3 and DDR2 DIMMs are not compatible to each other or DDR DIMMs. Be sure to install DDR3 DIMMs on this motherboard.

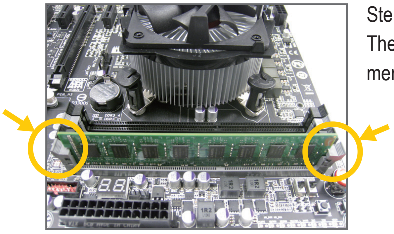




A DDR3 memory module has a notch, so it can only fit in one direction. Follow the steps below to correctly install your memory modules in the memory sockets.



Step 1:
Note the orientation of the memory module. Spread the retaining clips at both ends of the memory socket. Place the memory module on the socket. As indicated in the picture on the left, place your fingers on the top edge of the memory, push down on the memory and insert it vertically into the memory socket.

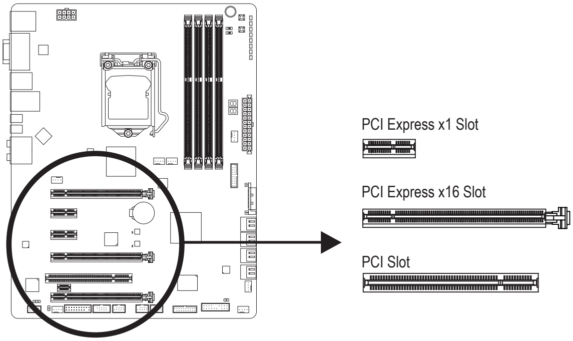


Step 2:
The clips at both ends of the socket will snap into place when the memory module is securely inserted.

1-5 Installing an Expansion Card

Read the following guidelines before you begin to install an expansion card:

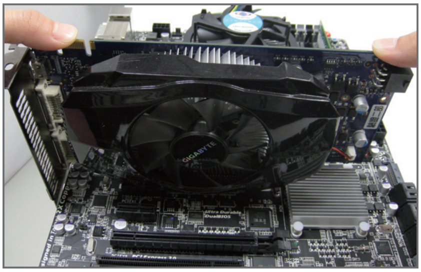
- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage.



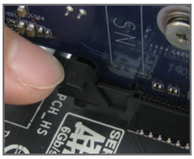
Follow the steps below to correctly install your expansion card in the expansion slot.

1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel.
2. Align the card with the slot, and press down on the card until it is fully seated in the slot.
3. Make sure the metal contacts on the card are completely inserted into the slot.
4. Secure the card's metal bracket to the chassis back panel with a screw.
5. After installing all expansion cards, replace the chassis cover(s).
6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s).
7. Install the driver provided with the expansion card in your operating system.

Example: Installing and Removing a PCI Express Graphics Card:



- Installing a Graphics Card:
  Gently push down on the top edge of the card until it is fully inserted into the PCI Express slot. Make sure the card is securely seated in the slot and does not rock.



- Removing the Card:
  Gently push back on the lever on the slot and then lift the card straight out from the slot.

1-6 Setting up AMD CrossFire™/NVIDIA® SLI™ Configuration

A. System Requirements

- Windows 8/7 operating system
- A CrossFire/SLI-supported motherboard with two PCI Express x16 slots and correct driver
- CrossFire/SLI-ready graphics cards of identical brand and chip and correct driver
- CrossFire (Note)/SLI bridge connectors
- A power supply with sufficient power is recommended (Refer to the manual of your graphics cards for the power requirement)

B. Connecting the Graphics Cards

Step 1:

Observe the steps in "1-5 Installing an Expansion Card" and install CrossFire/SLI graphics cards on the PCIEX16 and PCIEX8 slots.

Step 2:

Insert the CrossFire (Note)/SLI bridge connectors in the CrossFire/SLI gold edge connectors on top of the cards.

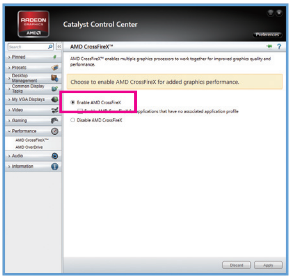
Step 3:

Plug the display cable into the graphics card on the PCIEX16 slot.

C. Configuring the Graphics Card Driver

C-1. To Enable CrossFire Function

After installing the graphics card driver in the operating system, go to the **Catalyst Control Center**. Browse to **Performance\AMD CrossFireX™ Configuration** and ensure the **Enable CrossFireX™** check box is selected. and click **Apply**.


RADEON GRAPHICS
AMD
Catalyst Control Center
Preferences
Search
Pinned
Presets
Desktop Management
Common Display Tasks
My VGA Displays
Video
Gaming
Performance
AMD CrossFireX™
AMD OverDrive
Audio
Information
Discard
Apply

AMD CrossFireX™

AMD CrossFireX™ enables multiple graphics processors to work together for improved graphics quality and performance.

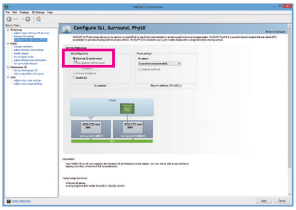
Choose to enable AMD CrossFireX for added graphics performance.

● Enable AMD CrossFireX

○ Disable AMD CrossFireX

C-2. To Enable SLI Function

After installing the graphics card driver in the operating system, go to the **NVIDIA Control Panel**. Browse to the **Configure SLI, Surround, PhysX** screen and ensure **Maximize 3D performance** is enabled.


NVIDIA Control Panel
File Edit Desktop 3D Settings Help
Restore Defaults
PhysX
SLI
Apply
Cancel

Configure SLI, Surround, PhysX

● Maximize 3D performance

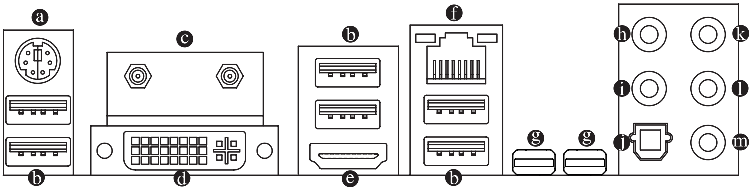
○ Disable SLI

SLI enabled

(Note) The bridge connector(s) may be needed or not depending on your graphics cards.

- Procedure and driver screen for enabling CrossFire/SLI technology may differ by graphics cards and driver version. Refer to the manual that came with your graphics cards for more information about enabling CrossFire/SLI technology.
- When two or more graphics cards are installed, we recommend that you connect the SATA power cable from the power supply to the ATX4P connector to ensure system stability.

1-7 Back Panel Connectors



ⓐ PS/2 Keyboard/Mouse Port

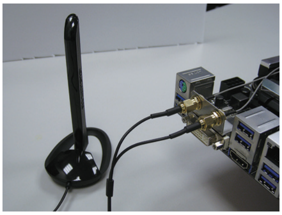
Use this port to connect a PS/2 mouse or keyboard.

ⓑ USB 3.0/2.0 Port

The USB 3.0 port supports the USB 3.0 specification and is compatible to the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

ⓒ Antenna Connector

Use this connector to connect an antenna.



Tighten the antenna cables to the antenna connectors and then move the antenna to a place where the signal is good.

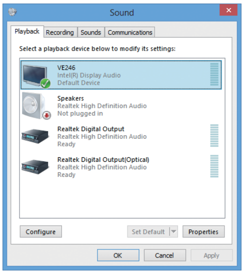
ⓓ DVI-I Port (Note)

The DVI-I port conforms to the DVI-I specification and supports a maximum resolution of 1920x1200 (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports DVI-I connection to this port.

ⓔ HDMI Port (Note)

The HDMI port is HDCP compliant and supports Dolby True HD and DTS HD Master Audio formats. It also supports up to 192KHz/24bit 8-channel LPCM audio output. You can use this port to connect your HDMI-supported monitor. The maximum supported resolution is 4096x2160, but the actual resolutions supported are dependent on the monitor being used.

After installing the HDMI device, make sure to set the default sound playback device to HDMI. (The item name may differ depending on your operating system. The screenshot below is from Windows 8.)



Select a playback device below to modify its settings:

VE246
Intel(R) Display Audio
Default Device

Speakers
Realtek High Definition Audio
Not plugged in

Realtek Digital Output
Realtek High Definition Audio
Ready

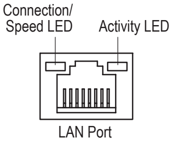
Realtek Digital Output(Optical)
Realtek High Definition Audio
Ready

In Windows 8, select All apps>Control Panel>Hardware and Sound>Sound>Playback, set Intel(R) Display Audio to the default playback device.

(Note) Simultaneous output for DVI-I and the MDP2 Thunderbolt port is not supported. If a monitor is connected to the MDP2 Thunderbolt port , the DVI-I port will become unavailable.

ⓕ RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



Connection/Speed LED:

State	Description
Orange	1 Gbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

Activity LED:

State	Description
Blinking	Data transmission or receiving is occurring
On	No data transmission or receiving is occurring

ⓖ Thunderbolt Port (Note)

Use this port for Thunderbolt devices or Mini-DisplayPort monitors. Because of the limited I/O resources of the PC architecture, the number of Thunderbolt devices that can be used is dependent on the number of the PCI Express and PCI devices being installed. Each Thunderbolt port can daisy chain about three devices. To connect more Thunderbolt devices, adjust the settings under **Peripherals\Intel(R) Thunderbolt** in BIOS Setup.

The two Thunderbolt ports support two DisplayPort monitors in total. The two DisplayPort monitors that are daisy chained to the same port must be separated by a Thunderbolt device. The maximum supported resolution is 2560x1600, but the actual resolutions supported are dependent on the monitor being used.

After installing the DisplayPort device, make sure the default device for sound playback is the DisplayPort device. (The item name may differ from operating system. For example, go to Start>Control Panel>Hardware and Sound>Sound>Playback and set the DisplayPort device as the default playback device. Refer to the HDMI settings information on the previous page for the configuration dialog box.)

Triple Display Configurations for the Onboard Graphics:

Triple-display configurations are supported after you install motherboard drivers in OS. Only dual-display configurations are supported during the BIOS Setup or POST process.

ⓗ Center/Subwoofer Speaker Out Jack (Orange)

Use this audio jack to connect center/subwoofer speakers in a 5.1/7.1-channel audio configuration.

ⓘ Rear Speaker Out Jack (Black)

This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

ⓙ Optical S/PDIF Out Connector

This connector provides digital audio out to an external audio system that supports digital optical audio. Before using this feature, ensure that your audio system provides an optical digital audio in connector.

ⓚ Line In Jack (Blue)

The default line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

(Note) Simultaneous output for DVI-I and the MDP2 Thunderbolt port is not supported. If a monitor is connected to the MDP2 Thunderbolt port , the DVI-I port will become unavailable.

- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

ⓛ **Line Out Jack (Green)**

The default line out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

ⓜ **Mic In Jack (Pink)**

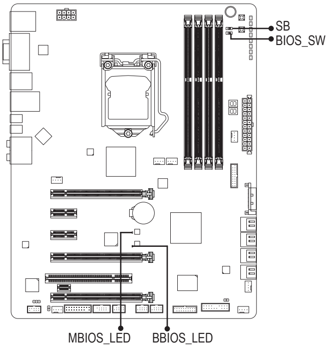
The default Mic in jack. Microphones must be connected to this jack.

The audio jacks can be reconfigured to perform different functions via the audio software (except for the Line Out jack). If you install a Side Speaker, you need to retask other audio jack to be Side Speaker out. Only microphones still MUST be connected to the default Mic in jack. Refer to the instructions on setting up a 2/4/5.1/7.1-channel audio configuration in Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio."

1-8 Onboard Buttons, Switches, and LEDs

BIOS Switch and BIOS LED Indicators

The BIOS switch (BIOS_SW) allows users to easily select a different BIOS for boot up or overclocking, helping to reduce BIOS failure during overclocking. The SB switch allows enabling or disabling of the Dual BIOS function. The LED indicator (MBIOS_LED/BBIOS_LED) shows which BIOS is active.



BIOS Switch:

BIOS_SW

2 □■ 1 1: Main BIOS (Boot from the main BIOS)

2 ■□ 1 2: Backup BIOS (Boot from the backup BIOS)

SB

2 □■ 1 1: Dual BIOS

2 ■□ 1 2: Single BIOS

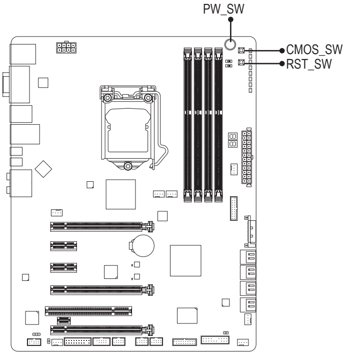
BIOS LED Indicators:

MBIOS_LED (The main BIOS is active)

BBIOS_LED (The backup BIOS is active)

Quick Buttons

This motherboard has 3 quick buttons: power button, reset button, and clear CMOS button. The power button and reset button allow users to quickly turn on/off or reset the computer in an open-case environment when they want to change hardware components or conduct hardware testing. Use the clear CMOS button to clear the BIOS configuration and reset the CMOS values to factory defaults when needed.



PW_SW: Power button

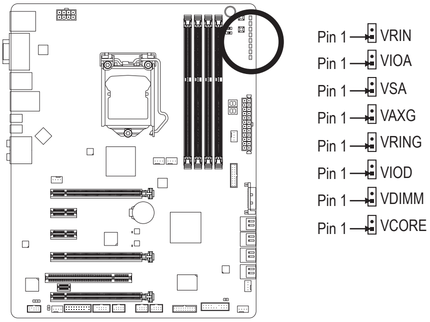
RST_SW: Reset button

CMOS_SW: Clear CMOS Button

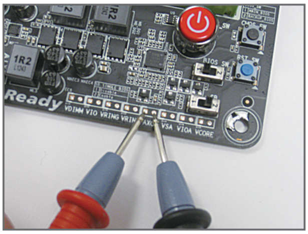
- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- Do not use the clear CMOS button when the system is on, or the system may shutdown and data loss or damage may occur.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

Voltage Measurement Points

Users can use a multimeter to measure component voltages, including VRIN, VIOA, VSA, VAXG, VRING, VIOD, VDIMM, and VCORE. You can employ the following way to measure component voltages.


Pin 1 VRIN
Pin 1 VIOA
Pin 1 VSA
Pin 1 VAXG
Pin 1 VRING
Pin 1 VIOD
Pin 1 VDIMM
Pin 1 VCORE

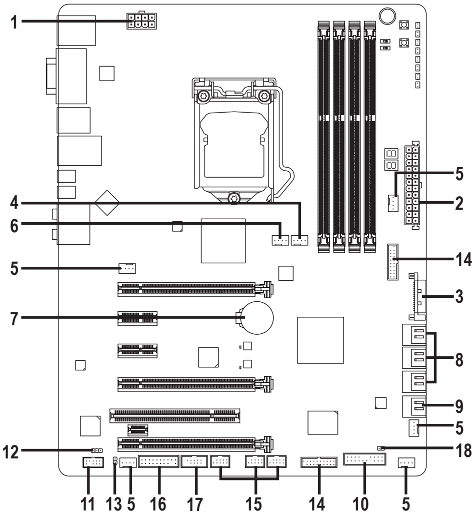
Pin No.	Definition
1	Power
2	GND


Ready
VDIMM VIO VRING VRIN VAXG VSA VIOA VCORE

Steps:

Connect the red lead of the multimeter to the pin 1 (Power) of a voltage measurement point and the black lead to the pin 2 (ground).

1-9 Internal Connectors



1)	ATX_12V_2X4	10)	F_PANEL
2)	ATX	11)	F_AUDIO
3)	ATX4P	12)	SPDIF_IN
4)	CPU_FAN	13)	SPDIF_O
5)	SYS_FAN1/2/3/4/5	14)	F_USB30_1/F_USB30_2
6)	CPU_OPT	15)	F_USB1/F_USB2/F_USB3
7)	BAT	16)	TPM
8)	SATA3 0/1/2/3/4/5	17)	COMA
9)	GSATA3 6/7	18)	CLR_CMOS

Read the following guidelines before connecting external devices:

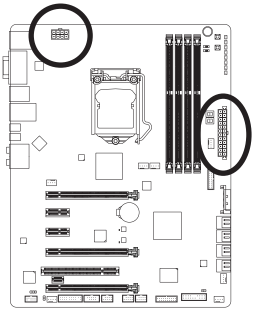
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

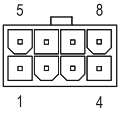
1/2) ATX_12V_2X4/ATX (2x4 12V Power Connector and 2x12 Main Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation.

The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.

To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.

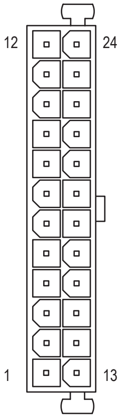




ATX_12V_2X4

ATX_12V_2X4:

Pin No.	Definition
1	GND (Only for 2x4-pin 12V)
2	GND (Only for 2x4-pin 12V)
3	GND
4	GND
5	+12V (Only for 2x4-pin 12V)
6	+12V (Only for 2x4-pin 12V)
7	+12V
8	+12V



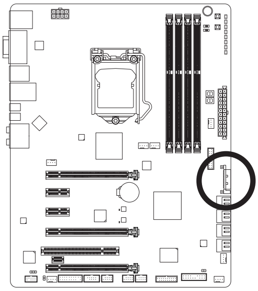
ATX

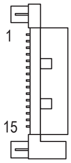
ATX:

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON (soft On/Off)
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	-5V
9	5VSB (stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V (Only for 2x12-pin ATX)	23	+5V (Only for 2x12-pin ATX)
12	3.3V (Only for 2x12-pin ATX)	24	GND (Only for 2x12-pin ATX)

3) ATX4P (PCIe Power Connector)

The power connector provides auxiliary power to the onboard PCI Express x16 slots. When two or more graphics cards are installed, we recommend that you connect the SATA power cable from the power supply to the ATX4P connector to ensure system stability.

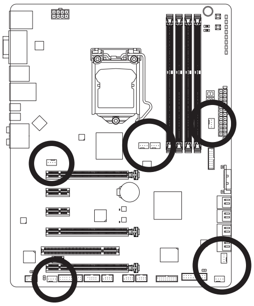


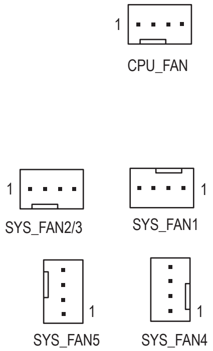


Pin No.	Definition
1	NC
2	NC
3	NC
4	GND
5	GND
6	GND
7	VCC
8	VCC
9	VCC
10	GND
11	GND
12	GND
13	+12V
14	+12V
15	+12V

4/5) CPU_FAN/SYS_FAN1/SYS_FAN2/SYS_FAN3/SYS_FAN4/SYS_FAN5 (Fan Headers)

All fan headers on this motherboard are 4-pin. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.





CPU_FAN:

Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

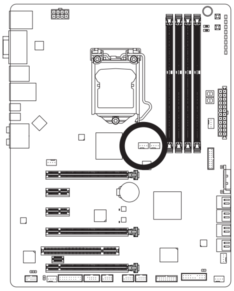
SYS_FAN1/2/3/4/5:

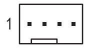
Pin No.	Definition
1	GND
2	+12V /Speed Control
3	Sense
4	VCC

- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

6) CPU_OPT (Water Cooling CPU Fan Header)

The fan header is 4-pin and possesses a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design.



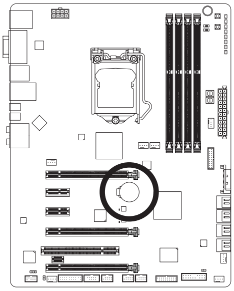


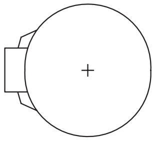
Pin No.	Definition
1	GND
2	+12V /Speed Control
3	Sense
4	VCC

- Be sure to connect fan cables to the fan headers to prevent your CPU from overheating. Overheating may result in damage to the CPU may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

7) BAT (Battery)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.





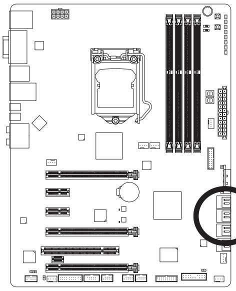
You may clear the CMOS values by removing the battery:

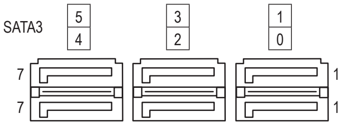
1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.

- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

8) SATA3 0/1/2/3/4/5 (SATA 6Gb/s Connectors, Controlled by Intel® Z87 Chipset)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The Intel® Z87 Chipset supports RAID 0, RAID 1, RAID 5, and RAID 10. Refer to Chapter 3, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.

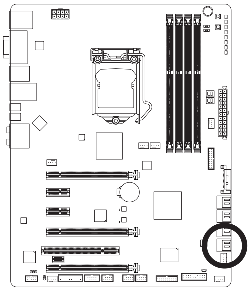


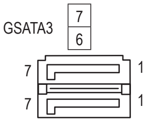


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

9) GSATA3 6/7 (SATA 6Gb/s Connectors, Controlled by Marvell® 88SE9172 Chip)

The SATA connector conforms to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The Marvell® 88SE9172 chip supports RAID 0 and RAID 1. Refer to Chapter 3, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.



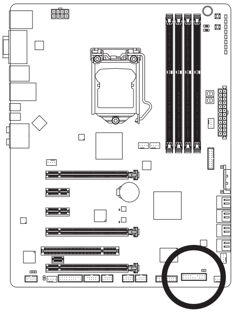


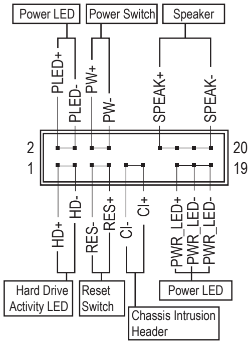
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number.
- A RAID 5 configuration requires at least three hard drives. (The total number of hard drives does not have to be an even number.)
- A RAID 10 configuration requires four hard drives.

10) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.





- **PLED/PWR_LED** (Power LED, Yellow/Purple):

System Status	LED
S0	On
S3/S4/S5	Off

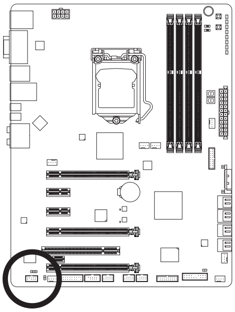
Connects to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

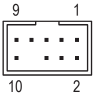
- **PW** (Power Switch, Red):
  Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information).
- **SPEAK** (Speaker, Orange):
  Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup.
- **HD** (Hard Drive Activity LED, Blue):
  Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.
- **RES** (Reset Switch, Green):
  Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.
- **CI** (Chassis Intrusion Header, Gray):
  Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

11) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.





For HD Front Panel Audio:

Pin No.	Definition
1	MIC2_L
2	GND
3	MIC2_R
4	-ACZ_DET
5	LINE2_R
6	GND
7	FAUDIO_JD
8	No Pin
9	LINE2_L
10	GND

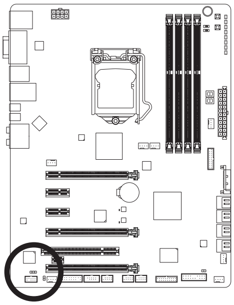
For AC'97 Front Panel Audio:

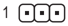
Pin No.	Definition
1	MIC
2	GND
3	MIC Power
4	NC
5	Line Out (R)
6	NC
7	NC
8	No Pin
9	Line Out (L)
10	NC

- The front panel audio header supports HD audio by default. If your chassis provides an AC'97 front panel audio module, refer to the instructions on how to activate AC'97 functionality via the audio software in Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio."
- Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio."
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

12) SPDIF_IN (S/PDIF In Header)

This header supports digital S/PDIF In and can connect to an audio device that supports digital audio out via an optional S/PDIF In cable. For purchasing the optional S/PDIF In cable, please contact the local dealer.



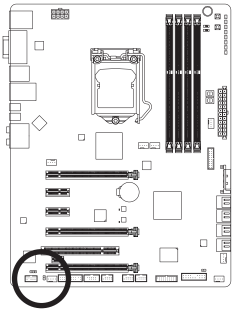


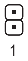
Pin No.	Definition
1	Power
2	SPDIFI
3	GND

13) SPDIF_O (S/PDIF Out Header)

This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time.

For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card.

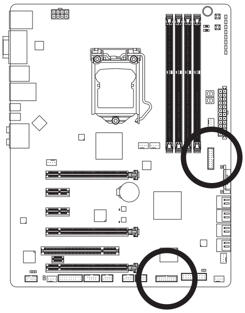


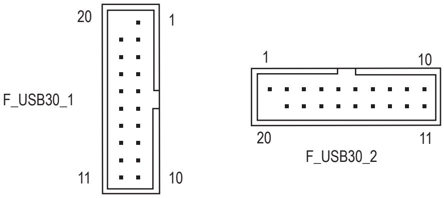


Pin No.	Definition
1	SPDIFO
2	GND

14) F_USB30_1/F_USB30_2 (USB 3.0/2.0 Headers)

The headers conform to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.





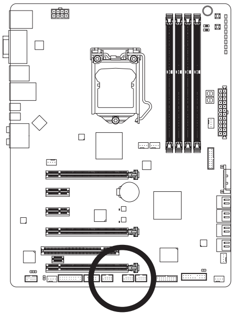
Pin No.	Definition	Pin No.	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	NC	20	No Pin

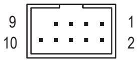
Only the USB ports routed to the F_USB30_1 header can support the ON/OFF Charge2 function.

Prior to installing the USB front panel, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB front panel.

15) F_USB1/F_USB2/F_USB3 (USB 2.0/1.1 Headers)

The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



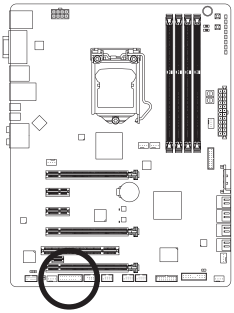


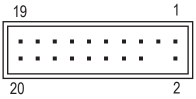
Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC

- Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB 2.0/1.1 header.
- Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

16) TPM (Trusted Platform Module Header)

You may connect a TPM (Trusted Platform Module) to this header.

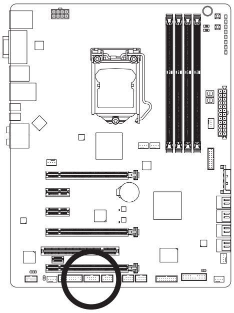


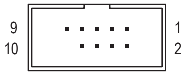


Pin No.	Definition	Pin No.	Definition
1	LCLK	11	LAD0
2	GND	12	GND
3	LFRAME	13	NC
4	No Pin	14	ID
5	LRESET	15	SB3V
6	NC	16	SERIRQ
7	LAD3	17	GND
8	LAD2	18	NC
9	VCC3	19	NC
10	LAD1	20	SUSCLK

17) COMA (Serial Port Header)

The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.

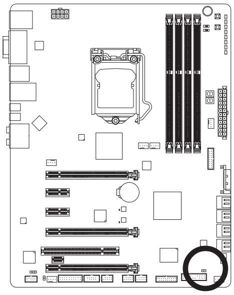




Pin No.	Definition
1	NDCD-
2	NSIN
3	NSOUT
4	NDTR-
5	GND
6	NDSR-
7	NRTS-
8	NCTS-
9	NRI-
10	No Pin

18) CLR_CMOS (Clear CMOS Jumper)

Use this jumper to clear the BIOS configurations and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds.



Open: Normal

Short: Clear CMOS Values

- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features.

When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility.

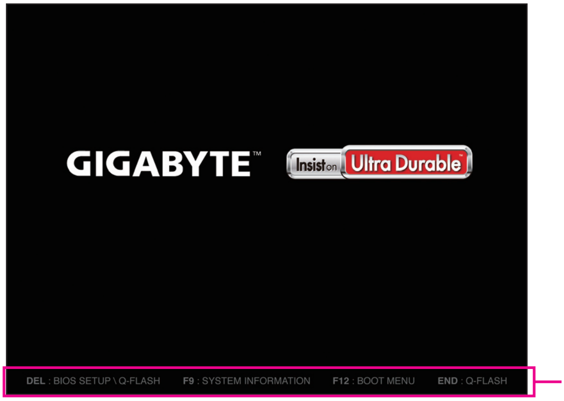
- Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
- @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS.

For instructions on using the Q-Flash and @BIOS utilities, refer to Chapter 5, "BIOS Update Utilities."

- Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery or the clear CMOS jumper/button in Chapter 1 for how to clear the CMOS values.)

2-1 Startup Screen

The following startup Logo screen will appear when the computer boots.



DEL : BIOS SETUP \ Q-FLASH **F9** : SYSTEM INFORMATION **F12** : BOOT MENU **END** : Q-FLASH

Function Keys

Function Keys:

<DEL>: BIOS SETUP\Q-FLASH

Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup.

<F9>: SYSTEM INFORMATION

Press the <F9> key to display your system information.

<F12>: BOOT MENU

Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up arrow key <↑> or the down arrow key <↓> to select the first boot device, then press <Enter> to accept. The system will boot from the device immediately.

Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings.

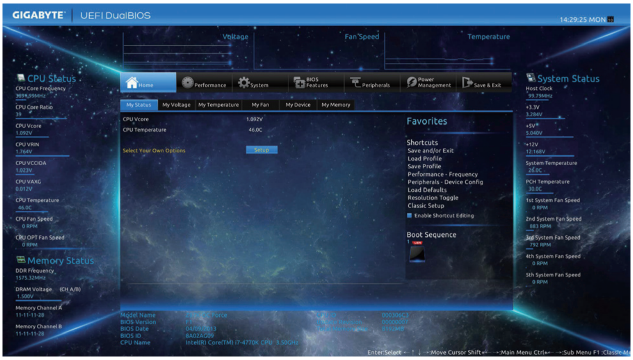
<END>: Q-FLASH

Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

2-2 The Main Menu

A. Dashboard Mode (Default)

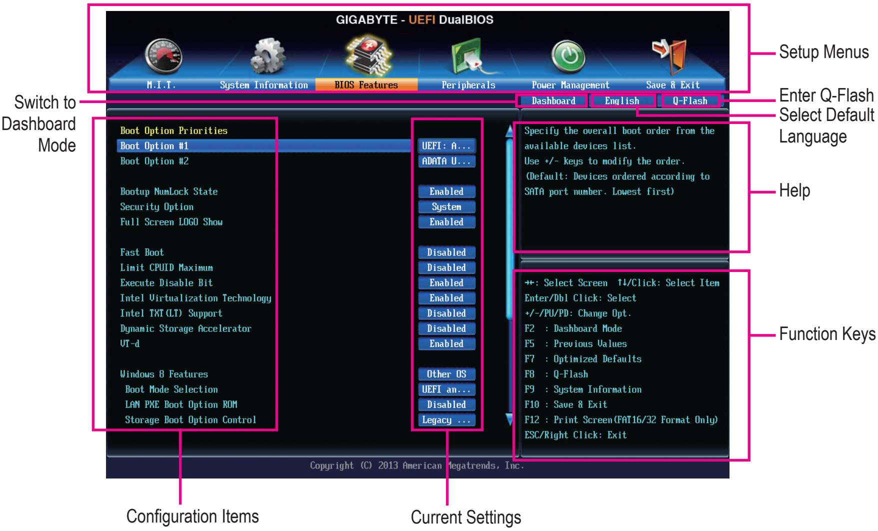
Differing from traditional UEFI interface, the Dashboard Mode provides a fancy and user-friendly BIOS environment where users can easily point and click through various settings and make adjustments for optimum performance. In Dashboard Mode, you can use your mouse to move through the option menus for quick configuration or you can click **Classic Setup** under the **Shortcuts** list on the right of the screen or press <F2> to switch to the traditional BIOS Setup screen.



B. Classic Setup

In Classic Setup, you can press the arrow keys on your keyboard to move among the items and press <Enter> to accept or enter a sub-menu. Or you can use your mouse to select the item you want.

(Sample BIOS Version: D30)


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash
Setup Menus
Switch to Dashboard Mode
Enter Q-Flash
Select Default Language
Help
Function Keys
Configuration Items
Current Settings

Boot Option Priorities	
Boot Option #1	UEFI: A...
Boot Option #2	ADATA U...
Bootup NumLock State	Enabled
Security Option	System
Full Screen LOGO Show	Enabled
Fast Boot	Disabled
Limit CPUID Maximum	Disabled
Execute Disable Bit	Enabled
Intel Virtualization Technology	Enabled
Intel TXT(LT) Support	Disabled
Dynamic Storage Accelerator	Disabled
VT-d	Enabled
Windows 8 Features	Other OS
Boot Mode Selection	UEFI an...
LAN PXE Boot Option ROM	Disabled
Storage Boot Option Control	Legacy ...

Specify the overall boot order from the available devices list.
Use +/- keys to modify the order.
(Default: Devices ordered according to SATA port number. Lowest first)

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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Classic Setup Function Keys

<←><→>	Move the selection bar to select a setup menu
<↑><↓>	Move the selection bar to select an configuration item on a menu
<Enter>	Execute command or enter a menu
<+>/<Page Up>	Increase the numeric value or make changes
<->/<Page Down>	Decrease the numeric value or make changes
<F2>	Switch to Dashboard Mode
<F5>	Restore the previous BIOS settings for the current submenus
<F7>	Load the Optimized BIOS default settings for the current submenus
<F8>	Access the Q-Flash utility
<F9>	Display system information
<F10>	Save all the changes and exit the BIOS Setup program
<F12>	Capture the current screen as an image and save it to your USB drive
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu

BIOS Setup Menus

■ M.I.T.

Use this menu to configure the clock, frequency, and voltages of your CPU and memory, etc. Or check the system/CPU temperatures, voltages, and fan speeds.

■ System

Use this menu to configure the default language used by the BIOS and system time and date. This menu also displays information on the devices connected to the SATA ports.

■ BIOS Features

Use this menu to configure the device boot order, advanced features available on the CPU, and the primary display adapter.

■ Peripherals

Use this menu to configure all peripheral devices, such as SATA, USB, integrated audio, and integrated LAN, etc.

■ Power Management

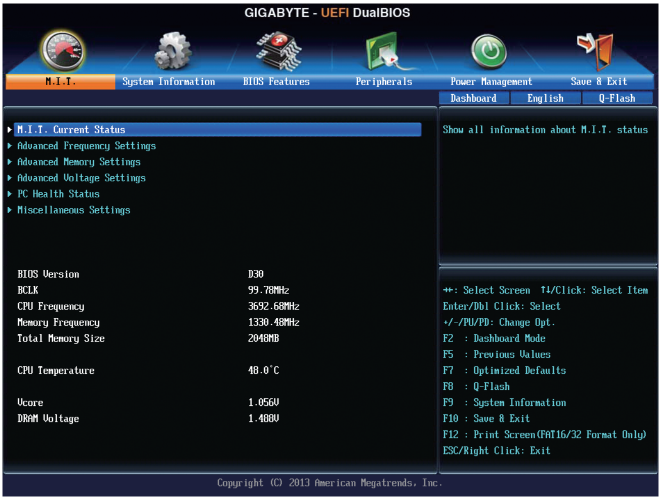
Use this menu to configure all the power-saving functions.

■ Save & Exit

Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. You can save the current BIOS settings to a profile or load optimized defaults for optimal-performance system operations.

- When the system is not stable as usual, select the **Load Optimized Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

2-3 M.I.T.


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash
M.I.T. Current Status
Advanced Frequency Settings
Advanced Memory Settings
Advanced Voltage Settings
PC Health Status
Miscellaneous Settings

Show all information about M.I.T. status

```
BIOS Version                D30
BCLK                        99.78MHz
CPU Frequency               3692.68MHz
Memory Frequency            1330.48MHz
Total Memory Size           2048MB

CPU Temperature             48.0°C

Vcore                       1.056V
DRAM Voltage                1.488V
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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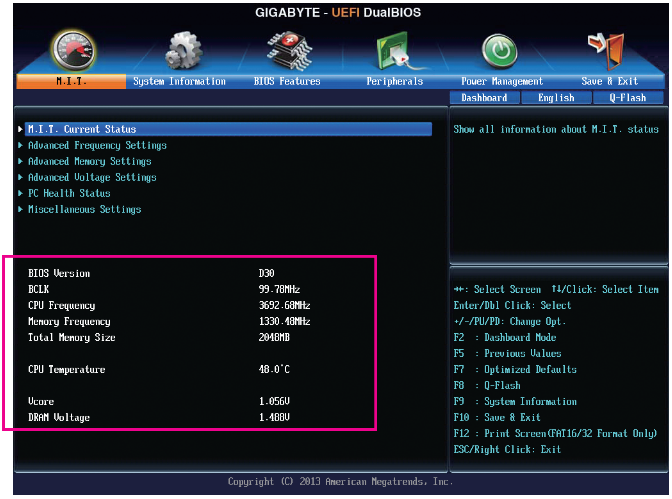
Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.)


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash
M.I.T. Current Status
Advanced Frequency Settings
Advanced Memory Settings
Advanced Voltage Settings
PC Health Status
Miscellaneous Settings

Show all information about M.I.T. status

BIOS Version D30
BCLK 99.78MHz
CPU Frequency 3692.68MHz
Memory Frequency 1330.48MHz
Total Memory Size 2048MB
CPU Temperature 48.0°C
Vcore 1.056V
DRAM Voltage 1.488V

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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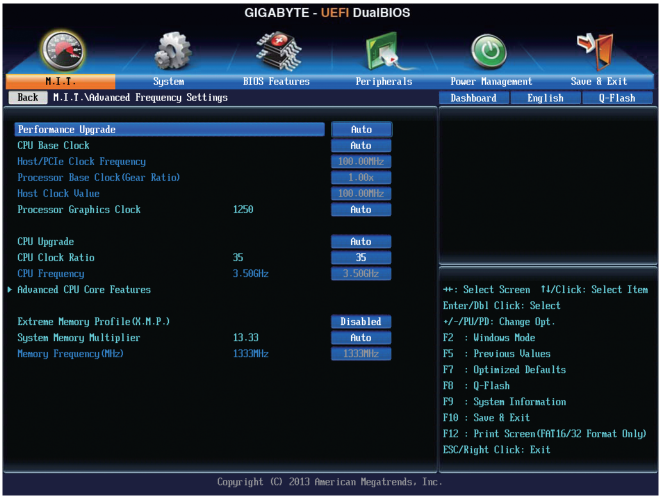
This section provides information on the BIOS version, CPU base clock, CPU frequency, memory frequency, total memory size, CPU temperature, Vcore, and memory voltage.

▶ M.I.T. Current Status

This screen provides information on CPU/memory frequencies/parameters.

Advanced Frequency Settings



```
Performance Upgrade                              Auto
CPU Base Clock                                   Auto
Host/PCIe Clock Frequency                        100.00MHz
Processor Base Clock(Gear Ratio)                 1.00x
Host Clock Value                                 100.00MHz
Processor Graphics Clock             1250        Auto

CPU Upgrade                                      Auto
CPU Clock Ratio                      35          35
CPU Frequency                        3.50GHz     3.50GHz
▸ Advanced CPU Core Features

Extreme Memory Profile(X.M.P.)                   Disabled
System Memory Multiplier             13.33       Auto
Memory Frequency(MHz)                1333MHz     1333MHz
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Windows Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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Performance Upgrade (Note)

Provides you with five different overclocking configurations. Options are: 20% Upgrade, 40% Upgrade, 60% Upgrade, 80% Upgrade, 100% Upgrade. (Default: Auto)

CPU Base Clock

Allows you to manually set the CPU base clock in 0.01 MHz increments. (Default: Auto)

Important: It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

Host/PCIe Clock Frequency (Note)

Allows you to manually set the host clock frequency (which controls CPU, PCIe, and memory frequencies) in 0.01 MHz increments.

This item is configurable only when **CPU Base Clock** is set to **Manual**.

Processor Base Clock (Gear Ratio) (Note)

Allows you to configure the **Processor Base Clock** by multiplying the **Host/PCIe Clock Frequency** by several preset host clock multipliers. This item is configurable only when **CPU Base Clock** is enabled.

Host Clock Value

This value is determined by multiplying the **Host/PCIe Clock Frequency** value by the **Processor Base Clock(Gear Ratio)** value.

Processor Graphics Clock

Allows you to set the onboard graphics clock. The adjustable range is from 400 MHz to 4000 MHz. (Default: Auto)

CPU Upgrade (Note)

Allows you to set the CPU frequency. Options may vary depending on the CPU being used. (Default: Auto)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

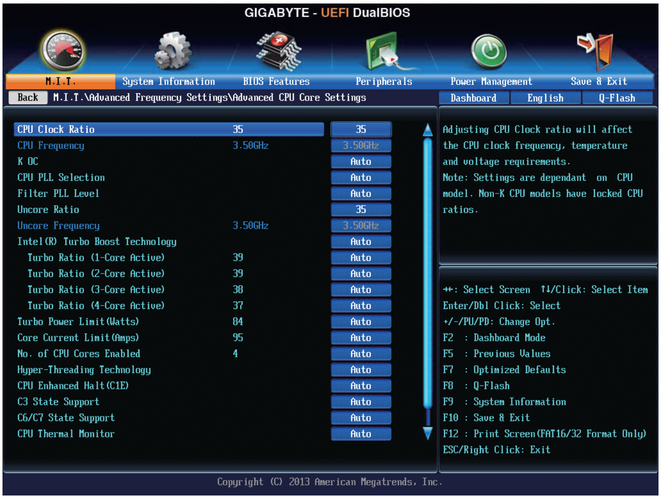
☞ CPU Clock Ratio

Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being installed.

☞ CPU Frequency

Displays the current operating CPU frequency.

▸ Advanced CPU Core Settings



```
M.I.T.\Advanced Frequency Settings\Advanced CPU Core Settings

CPU Clock Ratio                    35          35
CPU Frequency                      3.50GHz     3.50GHz
K OC                                           Auto
CPU PLL Selection                              Auto
Filter PLL Level                               Auto
Uncore Ratio                                   35
Uncore Frequency                   3.50GHz     3.50GHz
Intel(R) Turbo Boost Technology                Auto
  Turbo Ratio (1-Core Active)      39          Auto
  Turbo Ratio (2-Core Active)      39          Auto
  Turbo Ratio (3-Core Active)      38          Auto
  Turbo Ratio (4-Core Active)      37          Auto
Turbo Power Limit(Watts)           84          Auto
Core Current Limit(Amps)           95          Auto
No. of CPU Cores Enabled           4           Auto
Hyper-Threading Technology                     Auto
CPU Enhanced Halt(C1E)                         Auto
C3 State Support                               Auto
C6/C7 State Support                            Auto
CPU Thermal Monitor                            Auto

Adjusting CPU Clock ratio will affect
the CPU clock frequency, temperature
and voltage requirements.
Note: Settings are dependant  on  CPU
model. Non-K CPU models have locked CPU
ratios.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

☞ CPU Clock Ratio, CPU Frequency

The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

☞ K OC (Note)

Allows for increased performance by using certain CPUs. (Default: Auto)

☞ CPU PLL Selection

Allows you to set the CPU PLL. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Filter PLL Level

Allows you to set the Filter PLL. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Uncore Ratio

Allows you to set the CPU Uncore ratio. The adjustable range is dependent on the CPU being used.

☞ Uncore Frequency

Displays the current CPU Uncore frequency.

☞ Intel(R) Turbo Boost Technology (Note)

Allows you to determine whether to enable the Intel® CPU Turbo Boost technology. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Turbo Ratio (1-Core Active~4-Core Active) (Note)

Allows you to set the CPU Turbo ratios for different number of active cores. Auto sets the CPU Turbo ratios according to the CPU specifications. (Default: Auto)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

☞ Turbo Power Limit (Watts)

Allows you to set a power limit for CPU Turbo mode. When the CPU power consumption exceeds the specified power limit, the CPU will automatically reduce the core frequency in order to reduce the power. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

☞ Core Current Limit (Amps)

Allows you to set a current limit for CPU Turbo mode. When the CPU current exceeds the specified current limit, the CPU will automatically reduce the core frequency in order to reduce the current. **Auto** sets the power limit according to the CPU specifications. (Default: Auto)

☞ No. of CPU Cores Enabled (Note)

Allows you to select the number of CPU cores to enable in an Intel® multi-core CPU (the number of CPU cores may vary by CPU). **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Hyper-Threading Technology (Note)

Allows you to determine whether to enable multi-threading technology when using an Intel® CPU that supports this function. This feature only works for operating systems that support multi-processor mode. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ CPU Enhanced Halt (C1E) (Note)

Enables or disables Intel® CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ C3 State Support (Note)

Allows you to determine whether to let the CPU enter C3 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3 state is a more enhanced power-saving state than C1. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ C6/C7 State Support (Note)

Allows you to determine whether to let the CPU enter C6/C7 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C6/C7 state is a more enhanced power-saving state than C3. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ CPU Thermal Monitor (Note)

Enables or disables Intel® CPU Thermal Monitor function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage will be reduced when the CPU is overheated. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ CPU EIST Function (Note)

Enables or disables Enhanced Intel® SpeedStep Technology (EIST). Depending on CPU loading, Intel® EIST technology can dynamically and effectively lower the CPU voltage and core frequency to decrease average power consumption and heat production. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

☞ Extreme Memory Profile (X.M.P.) (Note)

Allows the BIOS to read the SPD data on XMP memory module(s) to enhance memory performance when enabled.

⏩ Disabled	Disables this function. (Default)
⏩ Profile1	Uses Profile 1 settings.
⏩ Profile2 (Note)	Uses Profile 2 settings.

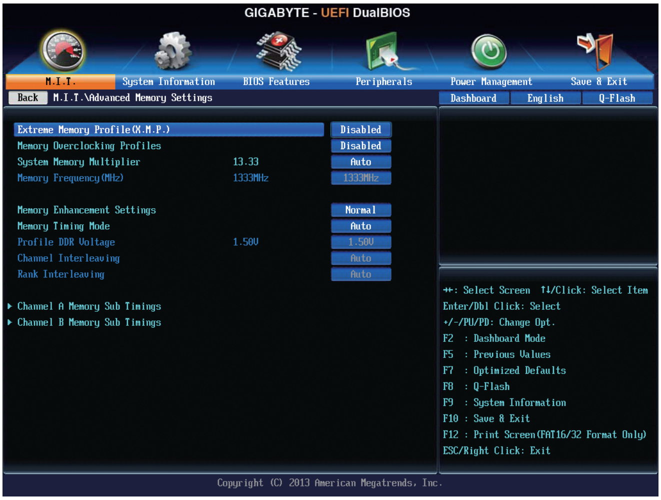
☞ System Memory Multiplier

Allows you to set the system memory multiplier. **Auto** sets memory multiplier according to memory SPD data. (Default: Auto)

☞ Memory Frequency (MHz)

The first memory frequency value is the normal operating frequency of the memory being used; the second is the memory frequency that is automatically adjusted according to the **System Memory Multiplier** settings.

▶ Advanced Memory Settings



M.I.T.\Advanced Memory Settings

```
Extreme Memory Profile(X.M.P.)                Disabled
Memory Overclocking Profiles                  Disabled
System Memory Multiplier          13.33       Auto
Memory Frequency(MHz)             1333MHz     1333MHz

Memory Enhancement Settings                   Normal
Memory Timing Mode                            Auto
Profile DDR Voltage               1.50V       1.50V
Channel Interleaving                          Auto
Rank Interleaving                             Auto

▸ Channel A Memory Sub Timings
▸ Channel B Memory Sub Timings
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Extreme Memory Profile (X.M.P.) (Note), System Memory Multiplier, Memory Frequency(MHz)

The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

☞ Memory Overclocking Profiles (Note)

Allows you to set the memory frequency. Options may vary depending on the memory being used. (Default: Disabled)

☞ Memory Enhancement Settings

Provides three different memory performance enhancement settings:
Normal (basic performance), Enhanced Stability, and Enhanced Performance. (Default: Normal)

☞ Memory Timing Mode

Manual and **Advanced** Manual allows the **Channel Interleaving**, **Rank Interleaving**, and memory timing settings below to be configurable. Options are: Auto (default), Manual, Advanced Manual.

(Note) This item is present only when you install a CPU and a memory module that support this feature.

☞ Profile DDR Voltage

When using a non-XMP memory module or **Extreme Memory Profile (X.M.P.)** is set to **Disabled**, this item will display as **1.50V**. When **Extreme Memory Profile (X.M.P.)** is set to **Profile1** or **Profile2**, this item will display the value based on the SPD data on the XMP memory.

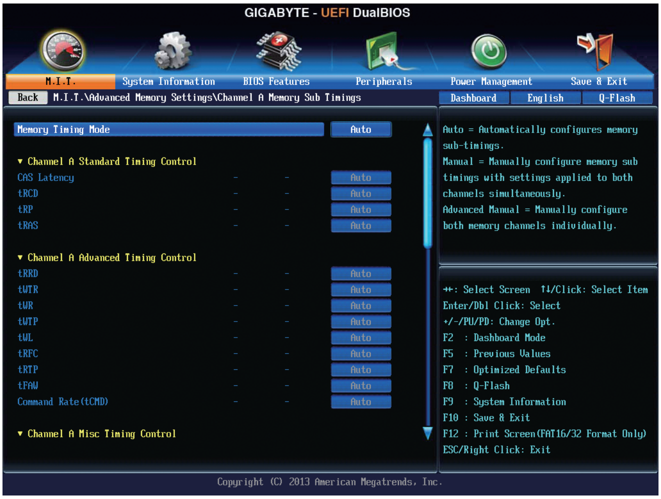
☞ Channel Interleaving

Enables or disables memory channel interleaving. **Enabled** allows the system to simultaneously access different channels of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ Rank Interleaving

Enables or disables memory rank interleaving. **Enabled** allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

▸ Channel A/B Memory Sub Timings



```
M.I.T.\Advanced Memory Settings\Channel A Memory Sub Timings

Memory Timing Mode                          Auto

▼ Channel A Standard Timing Control
CAS Latency               -     -           Auto
tRCD                      -     -           Auto
tRP                       -     -           Auto
tRAS                      -     -           Auto

▼ Channel A Advanced Timing Control
tRRD                      -     -           Auto
tWTR                      -     -           Auto
tWR                       -     -           Auto
tWTP                      -     -           Auto
tWL                       -     -           Auto
tRFC                      -     -           Auto
tRTP                      -     -           Auto
tFAW                      -     -           Auto
Command Rate(tCMD)        -     -           Auto

▼ Channel A Misc Timing Control
```

```
Auto = Automatically configures memory
sub-timings.
Manual = Manually configure memory sub
timings with settings applied to both
channels simultaneously.
Advanced Manual = Manually configure
both memory channels individually.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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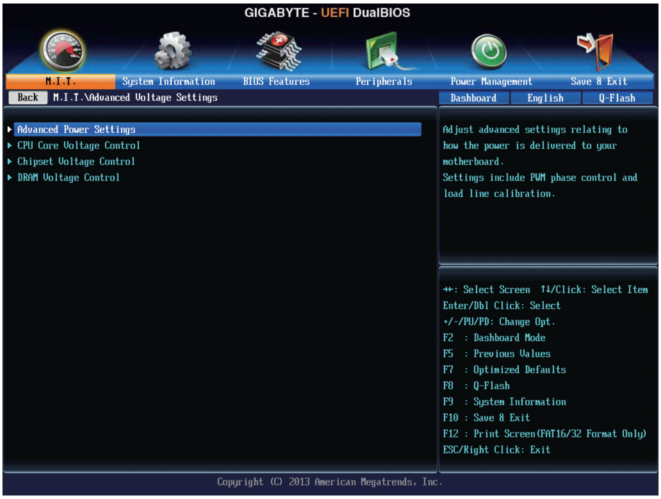
This sub-menu provides memory timing settings for each channel of memory. The respective timing setting screens are configurable only when **Memory Timing Mode** is set to **Manual** or **Advanced Manual**. Note: Your system may become unstable or fail to boot after you make changes on the memory timings. If this occurs, please reset the board to default values by loading optimized defaults or clearing the CMOS values.

Advanced Voltage Settings


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Dashboard
English
Q-Flash

```
M.I.T.\Advanced Voltage Settings

▸ Advanced Power Settings
▸ CPU Core Voltage Control
▸ Chipset Voltage Control
▸ DRAM Voltage Control
```

```
Adjust advanced settings relating to
how the power is delivered to your
motherboard.
Settings include PWM phase control and
load line calibration.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```
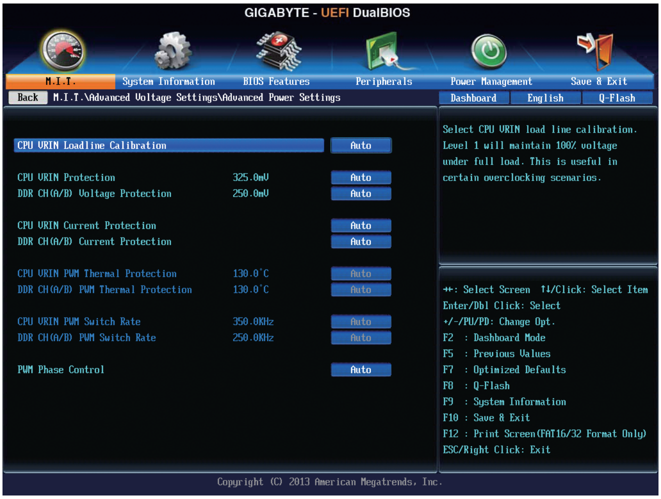

Advanced Power Settings


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Dashboard
English
Q-Flash

```
M.I.T.\Advanced Voltage Settings\Advanced Power Settings

CPU VRIN Loadline Calibration                      Auto

CPU VRIN Protection                    325.0mV     Auto
DDR CH(A/B) Voltage Protection         250.0mV     Auto

CPU VRIN Current Protection                        Auto
DDR CH(A/B) Current Protection                     Auto

CPU VRIN PWM Thermal Protection        130.0°C     Auto
DDR CH(A/B) PWM Thermal Protection     130.0°C     Auto

CPU VRIN PWM Switch Rate               350.0KHz    Auto
DDR CH(A/B) PWM Switch Rate            250.0KHz    Auto

PWM Phase Control                                  Auto
```

```
Select CPU VRIN load line calibration.
Level 1 will maintain 100% voltage
under full load. This is useful in
certain overclocking scenarios.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

☞ CPU VRIN Loadline Calibration

Allows you to set the Load-Line Calibration level for the CPU VRIN. The levels are (from highest to lowest): Extreme, Turbo, High, Medium, Low, and Standard. Selecting a higher level keeps the Vcore more consistent with what is set in BIOS under heavy load. **Auto** lets the BIOS automatically configure this setting and sets the voltage following Intel's specifications. (Default: Auto)

CPU VRIN Protection

Allows you to set the voltage limit on the CPU VRIN voltage for over-voltage protection. The adjustable range is from 150.0mV to 500.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

DDR CH(A/B) Voltage Protection

Allows you to set the voltage limit on Channel A and Channel B memory voltage for over-voltage protection. The adjustable range is from 150.0mV to 300.0mV. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

CPU VRIN Current Protection

Allows you to set the over-current protection level for the CPU VRIN voltage.

►► Auto	Lets BIOS automatically configure this setting. (Default)
►► Standard~Extreme	Selects Standard, Low, Medium, High, Turbo, or Extreme which represents different level of over-current protection for the Vcore.

DDR CH(A/B) Current Protection

Allows you to set the over-current protection level for the memory voltage.

►► Auto	Lets BIOS automatically configure this setting. (Default)
►► Standard~Extreme	Selects Standard, Low, Medium, High, Turbo, or Extreme which represents different level of over-current protection for the memory voltage.

CPU VRIN PWM Thermal Protection

Displays the PWM thermal protection threshold for the CPU VRIN area.

DDR CH(A/B) PWM Thermal Protection

Displays the PWM thermal protection threshold for the Channel A and Channel B memory area.

CPU VRIN PWM Switch Rate

Displays the CPU VRIN PWM frequency.

DDR CH(A/B) PWM Switch Rate

Displays the PWM frequency for Channel A and Channel B memory.

PWM Phase Control

Allows you to automatically change the PWM phase according to the CPU load. The power-saving levels are (from lowest to highest): eXm Perf (Extreme Performance), High Perf (High Performance), Perf (Performance), Balanced, Mid PWR (Mid Power), and Lite PWR (Light Power). **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

CPU Core Voltage Control

This section provides CPU voltage control options.

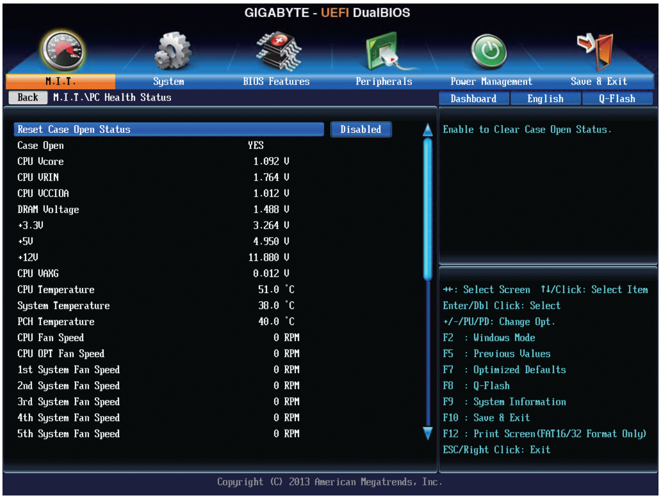
Chipset Voltage Control

This section provides Chipset voltage control options.

DRAM Voltage Control

This section provides memory voltage control options.

PC Health Status



```
M.I.T.\PC Health Status

Reset Case Open Status                  Disabled
Case Open                        YES
CPU Vcore                        1.092 V
CPU VRIN                         1.764 V
CPU VCCIOA                       1.012 V
DRAM Voltage                     1.488 V
+3.3V                            3.264 V
+5V                              4.950 V
+12V                            11.880 V
CPU VAXG                         0.012 V
CPU Temperature                   51.0 °C
System Temperature                38.0 °C
PCH Temperature                   40.0 °C
CPU Fan Speed                        0 RPM
CPU OPT Fan Speed                    0 RPM
1st System Fan Speed                 0 RPM
2nd System Fan Speed                 0 RPM
3rd System Fan Speed                 0 RPM
4th System Fan Speed                 0 RPM
5th System Fan Speed                 0 RPM

Enable to Clear Case Open Status.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Windows Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

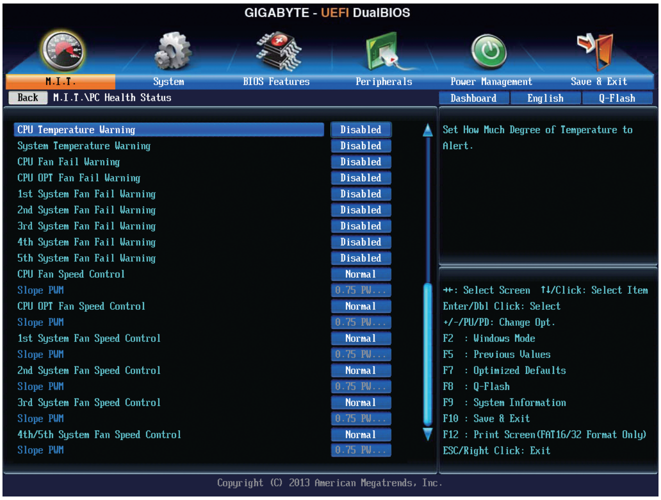

```
M.I.T.\PC Health Status

CPU Temperature Warning                 Disabled
System Temperature Warning              Disabled
CPU Fan Fail Warning                    Disabled
CPU OPT Fan Fail Warning                Disabled
1st System Fan Fail Warning             Disabled
2nd System Fan Fail Warning             Disabled
3rd System Fan Fail Warning             Disabled
4th System Fan Fail Warning             Disabled
5th System Fan Fail Warning             Disabled
CPU Fan Speed Control                   Normal
Slope PWM                               0.75 PW...
CPU OPT Fan Speed Control               Normal
Slope PWM                               0.75 PW...
1st System Fan Speed Control            Normal
Slope PWM                               0.75 PW...
2nd System Fan Speed Control            Normal
Slope PWM                               0.75 PW...
3rd System Fan Speed Control            Normal
Slope PWM                               0.75 PW...
4th/5th System Fan Speed Control        Normal
Slope PWM                               0.75 PW...

Set How Much Degree of Temperature to
Alert.

→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Windows Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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```

Reset Case Open Status

⏩ Disabled	Keeps or clears the record of previous chassis intrusion status. (Default)
⏩ Enabled	Clears the record of previous chassis intrusion status and the **Case Open** field will show "No" at next boot.

Case Open

Displays the detection status of the chassis intrusion detection device attached to the motherboard CI header. If the system chassis cover is removed, this field will show "Yes", otherwise it will show "No". To clear the chassis intrusion status record, set **Reset Case Open Status** to **Enabled**, save the settings to the CMOS, and then restart your system.

☞ CPU Vcore/CPU VRIN/CPU VCCIOA/DRAM Voltage/+3.3V/+5V/+12V/CPU VAXG

Displays the current system voltages.

☞ CPU/System/PCH Temperature

Displays current CPU/System/Chipset temperature.

☞ CPU/CPU OPT/System Fan Speed

Displays current CPU/CPU_OPT/system fan speeds.

☞ CPU/System Temperature Warning

Sets the warning threshold for CPU/system temperature. When CPU/system temperature exceeds the threshold, BIOS will emit warning sound. Options are: Disabled (default), 60°C/140°F, 70°C/158°F, 80°C/176°F, 90°C/194°F.

☞ CPU/CPU OPT/System Fan Fail Warning

Allows the system to emit warning sound if the fan is not connected or fails. Check the fan condition or fan connection when this occurs. (Default: Disabled)

☞ CPU Fan Speed Control (CPU_FAN Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

⏩ Normal	Allows the fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
⏩ Silent	Allows the fan to run at slow speeds.
⏩ Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
⏩ Full Speed	Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **CPU Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

☞ CPU OPT Fan Speed Control (CPU_OPT Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

⏩ Normal	Allows the fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
⏩ Silent	Allows the fan to run at slow speeds.
⏩ Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
⏩ Full Speed	Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the water cooling CPU fan speed. This item is configurable only when **CPU OPT Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

☞ 1st System Fan Speed Control (SYS_FAN1 Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

⏩ Normal	Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
⏩ Silent	Allows the fan to run at slow speeds.
⏩ Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
⏩ Full Speed	Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **1st System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

2nd System Fan Speed Control (SYS_FAN2 Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

Normal	Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
Silent	Allows the fan to run at slow speeds.
Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
Full Speed	Allows the fan to run at full speeds.

Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **2nd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

3rd System Fan Speed Control (SYS_FAN3 Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

Normal	Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
Silent	Allows the fan to run at slow speeds.
Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
Full Speed	Allows the fan to run at full speeds.

Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **3rd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

4th/5th System Fan Speed Control (SYS_FAN4 and SYS_FAN5 Connectors)

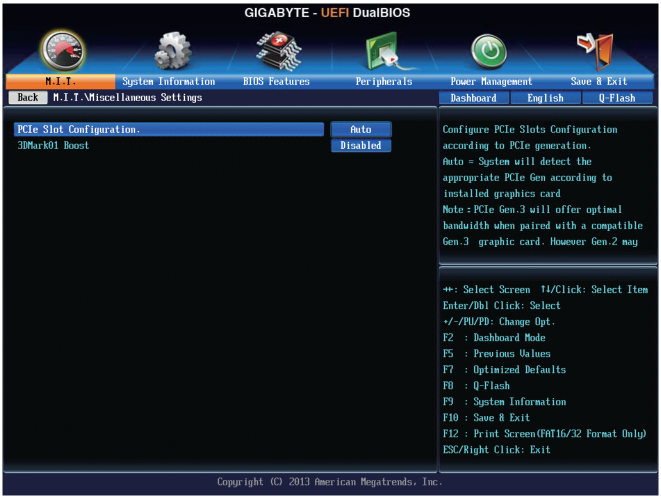
Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

Normal	Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
Silent	Allows the fan to run at slow speeds.
Manual	Allows you to control the fan speed under the **Fan Speed Percentage** item.
Full Speed	Allows the fan to run at full speeds.

Fan Speed Percentage

Allows you to control the fan speed. This item is configurable only when **4th/5th System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

Miscellaneous Settings


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
M.I.T.\Miscellaneous Settings
Dashboard
English
Q-Flash

PCIe Slot Configuration. Auto

3DMark01 Boost Disabled

Configure PCIe Slots Configuration according to PCIe generation.
Auto = System will detect the appropriate PCIe Gen according to installed graphics card
Note : PCIe Gen.3 will offer optimal bandwidth when paired with a compatible Gen.3 graphic card. However Gen.2 may

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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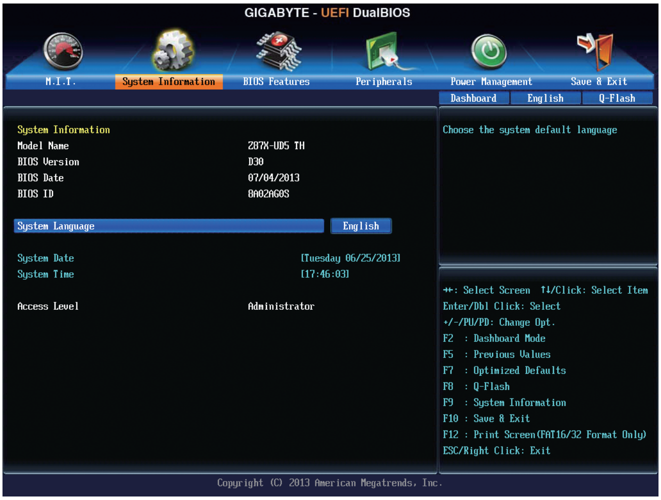
PCIe Slot Configuration

Allows you to set the operation mode of the PCI Express slots to Gen 1, Gen 2, or Gen 3. Actual operation mode is subject to the hardware specification of each slot. For example, the PCI Express x1 slots can support up to Gen 2 mode only. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

3DMark01 Boost

Allows you to determine whether to enhance some legacy benchmark performance. (Default: Disabled)

2-4 System Information



```
System Information
Model Name                              Z87X-UD5 TH
BIOS Version                            D30
BIOS Date                               07/04/2013
BIOS ID                                 8A02AG0S

System Language                         English

System Date                                  [Tuesday 06/25/2013]
System Time                                  [17:46:03]

Access Level                            Administrator
```

```
Choose the system default language
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

```
Copyright (C) 2013 American Megatrends, Inc.
```

This section provides information on your CPU, memory, motherboard model, and BIOS version. You can also select the default language used by the BIOS and manually set the system time.

☞ System Language

Selects the default language used by the BIOS.

☞ System Date

Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <Page Up> or <Page Down> key to set the desired value.

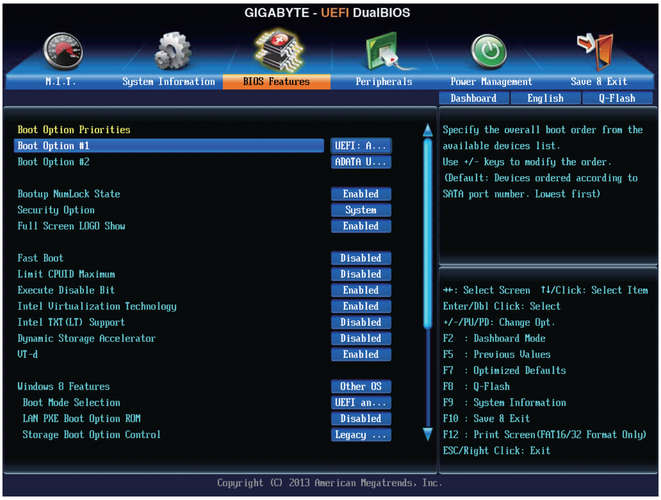
☞ System Time

Sets the system time. The time format is hour, minute, and second. For example, 1 p.m. is 13:0:0. Use <Enter> to switch between the Hour, Minute, and Second fields and use the <Page Up> or <Page Down> key to set the desired value.

☞ Access Level

Displays the current access level depending on the type of password protection used. (If no password is set, the default will display as Administrator.) The Administrator level allows you to make changes to all BIOS settings; the User level only allows you to make changes to certain BIOS settings but not all.

2-5 BIOS Features



```
Boot Option Priorities
Boot Option #1                          UEFI: A...
Boot Option #2                          ADATA U...

Bootup NumLock State                    Enabled
Security Option                         System
Full Screen LOGO Show                   Enabled

Fast Boot                               Disabled
Limit CPUID Maximum                     Disabled
Execute Disable Bit                     Enabled
Intel Virtualization Technology         Enabled
Intel TXT(LT) Support                   Disabled
Dynamic Storage Accelerator             Disabled
VT-d                                    Enabled

Windows 8 Features                      Other OS
 Boot Mode Selection                    UEFI an...
 LAN PXE Boot Option ROM                Disabled
 Storage Boot Option Control            Legacy ...
```

```
Specify the overall boot order from the
available devices list.
Use +/- keys to modify the order.
(Default: Devices ordered according to
SATA port number. Lowest first)
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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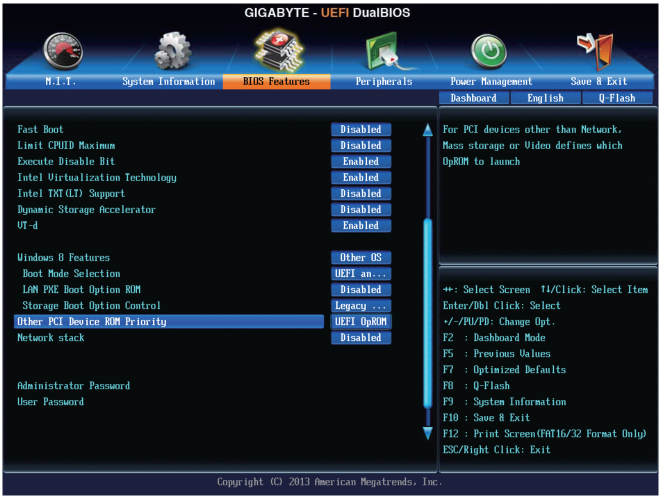

```
Fast Boot                               Disabled
Limit CPUID Maximum                     Disabled
Execute Disable Bit                     Enabled
Intel Virtualization Technology         Enabled
Intel TXT(LT) Support                   Disabled
Dynamic Storage Accelerator             Disabled
VT-d                                    Enabled

Windows 8 Features                      Other OS
 Boot Mode Selection                    UEFI an...
 LAN PXE Boot Option ROM                Disabled
 Storage Boot Option Control            Legacy ...
Other PCI Device ROM Priority           UEFI OpROM
Network stack                           Disabled


Administrator Password
User Password
```

```
For PCI devices other than Network,
Mass storage or Video defines which
OpROM to launch
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ **Boot Option Priorities**

Specifies the overall boot order from the available devices. For example, you can set hard drive as the first priority **(Boot Option #1)** and DVD ROM drive as the second priority **(Boot Option #2)**. The list only displays the device with the highest priority for a specific type. For example, only hard drive defined as the first priority on the **Hard Drive BBS Priorities** submenu will be presented here.

Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string.

Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

Bootup NumLock State

Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST. (Default: Enabled)

Security Option

Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup. After configuring this item, set the password(s) under the **Administrator Password/User Password** item.

▸▸ Setup	A password is only required for entering the BIOS Setup program.
▸▸ System	A password is required for booting the system and for entering the BIOS Setup program. (Default)

Full Screen LOGO Show

Allows you to determine whether to display the GIGABYTE Logo at system startup. **Disabled** skips the GIGABYTE Logo when the system starts up. (Default: Enabled)

Fast Boot

Enables or disables Fast Boot to shorten the OS boot process. **Ultra Fast** provides the fastest bootup speed. (Default: Disabled)

VGA Support

Allows you to select which type of operating system to boot.

▸▸ Auto	Enables legacy option ROM only.
▸▸ EFI Driver	Enables EFI option ROM. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

USB Support

▸▸ Disabled	All USB devices are disabled before the OS boot process completes.
▸▸ Full Initial	All USB devices are functional in the operating system and during the POST.
▸▸ Partial Initial	Part of the USB devices are disabled before the OS boot process completes. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled**. This item is disabled when **Fast Boot** is set to **Ultra Fast**.

PS2 Devices Support

▸▸ Disabled	All PS/2 devices are disabled before the OS boot process completes.
▸▸ Enabled	All PS/2 devices are functional in the operating system and during the POST. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled**. This item is disabled when **Fast Boot** is set to **Ultra Fast**.

NetWork Stack Driver Support

▸▸ Disabled	Disables booting from the network. (Default)
▸▸ Enabled	Enables booting from the network.

This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

Next Boot After AC Power Loss

▸▸ Normal Boot	Enables normal bootup upon the return of the AC power. (Default)
▸▸ Fast Boot	Keeps the Fast Boot settings upon the return of the AC power.

This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

Limit CPUID Maximum (Note)

Allows you to determine whether to limit CPUID maximum value. Set this item to **Disabled** for Windows XP operating system; set this item to **Enabled** for legacy operating system such as Windows NT4.0. (Default: Disabled)

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

☞ **Execute Disable Bit** (Note)

Enables or disables Intel® Execute Disable Bit function. This function may enhance protection for the computer, reducing exposure to viruses and malicious buffer overflow attacks when working with its supporting software and system. (Default: Enabled)

☞ **Intel Virtualization Technology** (Note)

Enables or disables Intel® Virtualization Technology. Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Enabled)

☞ **Intel TXT(LT) Support** (Note)

Enables or disables Intel® Trusted Execution Technology (Intel® TXT). Intel® Trusted Execution Technology provides a hardware-based security foundation. (Default: Disabled)

☞ **Dynamic Storage Accelerator**

Enables or disables Intel® Dynamic Storage Accelerator. When enabled, the hard drive I/O performance will be adjusted according to hard drive load. (Default: Disabled)

☞ **VT-d** (Note)

Enables or disables Intel® Virtualization Technology for Directed I/O. (Default: Enabled)

☞ **Windows 8 Features**

Allows you to select the operating system to be installed. (Default: Other OS)

☞ **CSM Support**

Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.

►► Always	Enables UEFI CSM. (Default)
►► Never	Disables UEFI CSM and supports UEFI BIOS boot process only.

This item is configurable only when **Windows 8 Features** is set to **Windows 8** or **Windows 8 WHQL**.

☞ **Boot Mode Selection**

Allows you to select which type of operating system to boot.

►► UEFI and Legacy	Allows booting from operating systems that support legacy option ROM or UEFI option ROM. (Default)
►► Legacy Only	Allows booting from operating systems that only support legacy Option ROM.
►► UEFI Only	Allows booting from operating systems that only support UEFI Option ROM.

This item is configurable only when **CSM Support** is set to **Always**.

☞ **LAN PXE Boot Option ROM**

Allows you to select whether to enable the legacy option ROM for the LAN controller. (Default: Disabled) This item is configurable only when **CSM Support** is set to **Always**.

☞ **Storage Boot Option Control**

Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

►► Disabled	Disables option ROM.
►► Legacy Only	Enables legacy option ROM only. (Default)
►► UEFI Only	Enables UEFI option ROM only.
►► Legacy First	Enables legacy option ROM first.
►► UEFI First	Enables UEFI option ROM first.

This item is configurable only when **CSM Support** is set to Always.

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

☞ **Other PCI Device ROM Priority**

Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other than the LAN, storage device, and graphics controllers.

⏩ Legacy OpROM	Enables legacy option ROM only.
⏩ UEFI OpROM	Enables UEFI option ROM only. (Default)

This item is configurable only when **CSM Support** is set to **Always**.

☞ **Network stack**

Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disabled)

☞ **Ipv4 PXE Support**

Enables or disables IPv4 PXE Support. This item is configurable only when **Network stack** is enabled.

☞ **Ipv6 PXE Support**

Enables or disables IPv6 PXE Support. This item is configurable only when **Network stack** is enabled.

☞ **Administrator Password**

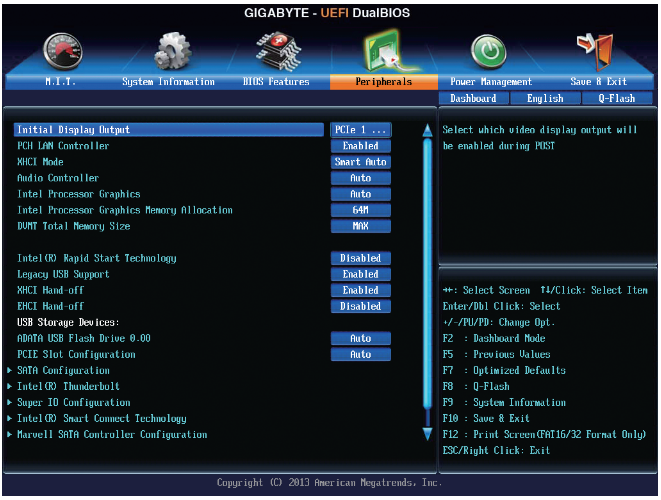
Allows you to configure an administrator password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. Differing from the user password, the administrator password allows you to make changes to all BIOS settings.

☞ **User Password**

Allows you to configure a user password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. However, the user password only allows you to make changes to certain BIOS settings but not all.

To cancel the password, press <Enter> on the password item and when requested for the password, enter the correct one first. When prompted for a new password, press <Enter> without entering any password. Press <Enter> again when prompted to confirm.

2-6 Peripherals


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash

Initial Display Output	PCIe 1 ...
PCH LAN Controller	Enabled
XHCI Mode	Smart Auto
Audio Controller	Auto
Intel Processor Graphics	Auto
Intel Processor Graphics Memory Allocation	64M
DVMT Total Memory Size	MAX
Intel(R) Rapid Start Technology	Disabled
Legacy USB Support	Enabled
XHCI Hand-off	Enabled
EHCI Hand-off	Disabled
USB Storage Devices:	
ADATA USB Flash Drive 0.00	Auto
PCIE Slot Configuration	Auto
▸ SATA Configuration	
▸ Intel(R) Thunderbolt	
▸ Super IO Configuration	
▸ Intel(R) Smart Connect Technology	
▸ Marvell SATA Controller Configuration	

Select which video display output will be enabled during POST

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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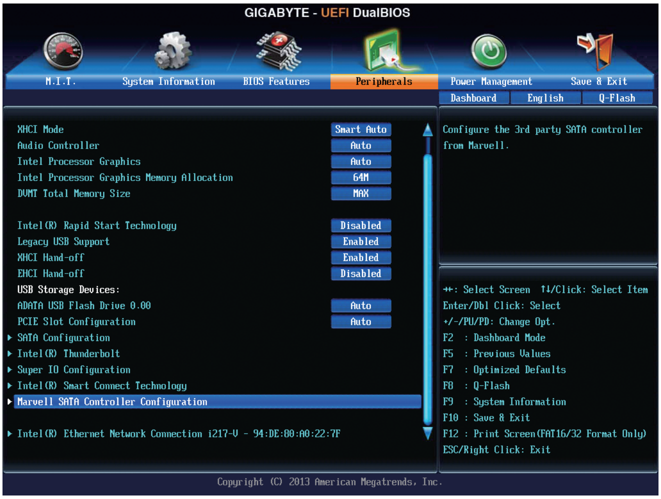
GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash

XHCI Mode	Smart Auto
Audio Controller	Auto
Intel Processor Graphics	Auto
Intel Processor Graphics Memory Allocation	64M
DVMT Total Memory Size	MAX
Intel(R) Rapid Start Technology	Disabled
Legacy USB Support	Enabled
XHCI Hand-off	Enabled
EHCI Hand-off	Disabled
USB Storage Devices:	
ADATA USB Flash Drive 0.00	Auto
PCIE Slot Configuration	Auto
▸ SATA Configuration	
▸ Intel(R) Thunderbolt	
▸ Super IO Configuration	
▸ Intel(R) Smart Connect Technology	
▸ Marvell SATA Controller Configuration	
▸ Intel(R) Ethernet Network Connection i217-V - 94:DE:80:A0:22:7F	

Configure the 3rd party SATA controller from Marvell.

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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☞ Initial Display Output

Specifies the first initiation of the monitor display from the installed PCI graphics card, PCI Express graphics card or the onboard graphics.

▸▸ IGFX	Sets the onboard graphics as the first display.
▸▸ PCIe 1 Slot	Sets the graphics card on the PCIEX16 slot as the first display. (Default)
▸▸ PCIe 2 Slot	Sets the graphics card on the PCIEX8 slot as the first display.
▸▸ PCIe 3 Slot	Sets the graphics card on the PCIEX4 slot as the first display.
▸▸ PCI	Sets the graphics card on the PCI slot as the first display.

PCH LAN Controller (Intel® GbE LAN Chip)

Enables or disables the Intel® GbE LAN function. (Default: Enabled)

If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

XHCI Mode (Intel® Z87 Chipset)

Allows you to determine the operating mode for the xHCI controller in OS.

⏩ Smart Auto	This mode is available only when the BIOS supports the xHCI controller in the pre-boot environment. This mode is similar to **Auto**, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment. This allows the use of USB 3.0 devices prior to OS boot. xHCI controller enabling and rerouting should follow the steps in **Auto**, when previous boot routs ports to EHCI. Note: This is the recommended mode when BIOS has xHCI pre-boot support. (Default)
⏩ Auto	BIOS routes the sharable ports to EHCI controller. Then it uses ACPI protocols to provide an option to enable the xHCI controller and reroute the sharable ports. Note: This is the recommended mode when BIOS does NOT have xHCI pre-boot support.
⏩ Enabled	All shared ports are eventually routed to the xHCI controller during the BIOS boot process. If BIOS does not have pre-boot support for the xHCI controller, it should initially route the sharable ports to the EHCI controller and then prior to OS boot it should route the ports to xHCI controller. Note: OS has to provide support for the xHCI controller in this mode. If the OS does not provide support, all sharable ports won't work.
⏩ Disabled	The USB 3.0 ports are routed to the EHCI controller and the xHCI controller is turned off. All USB 3.0 devices function as High Speed devices regardless of xHCI software support/availability.
⏩ Manual	Allows you to determine whether to rout the USB 3.0 ports to the xHCI or EHCI controller before booting to OS, and also provides you with options to manually rout each USB 3.0/2.0 port to xHCI or EHCI.

Audio Controller

Enables or disables the onboard audio function. (Default: Auto)

If you wish to install a 3rd party add-in audio card instead of using the onboard audio, set this item to **Disabled**.

Intel Processor Graphics

Enables or disables the onboard graphics function. (Default: Enabled)

Intel Processor Graphics Memory Allocation

Allows you to set the onboard graphics memory size. Options are: 32M~1024M. (Default: 64M)

DVMT Total Memory Size

Allows you to allocate the DVMT memory size of the onboard graphics. Options are: 128M, 256M, MAX. (Default: MAX)

Intel(R) Rapid Start Technology

Enables or disables Intel® Rapid Start Technology. (Default: Disabled)

Legacy USB Support

Allows USB keyboard/mouse to be used in MS-DOS. (Default: Enabled)

XHCI Hand-off

Determines whether to enable XHCI Hand-off feature for an operating system without XHCI Hand-off support. (Default: Enabled)

☞ EHCI Hand-off

Determines whether to enable EHCI Hand-off feature for an operating system without EHCI Hand-off support. (Default: Disabled)

☞ USB Storage Devices

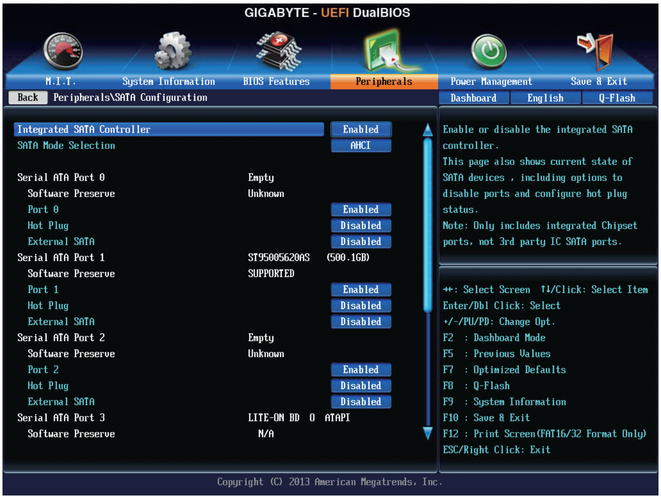
Displays a list of connected USB mass storage devices. This item appears only when a USB storage device is installed.

☞ PCIE Slot Configuration

Specifies the operating bandwidth for the PCIEX4 slot.

⏩ Auto	Lets the BIOS automatically configure this setting depending on the expansion card being installed. (Default)
⏩ x4	PCIEX4 operates at x4 mode.

▶ SATA Configuration



```
Integrated SATA Controller                          Enabled
SATA Mode Selection                                 AHCI

Serial ATA Port 0                   Empty
  Software Preserve                 Unknown
  Port 0                                            Enabled
  Hot Plug                                          Disabled
  External SATA                                     Disabled
Serial ATA Port 1                   ST95005620AS    (500.1GB)
  Software Preserve                 SUPPORTED
  Port 1                                            Enabled
  Hot Plug                                          Disabled
  External SATA                                     Disabled
Serial ATA Port 2                   Empty
  Software Preserve                 Unknown
  Port 2                                            Enabled
  Hot Plug                                          Disabled
  External SATA                                     Disabled
Serial ATA Port 3                   LITE-ON BD  0  ATAPI
  Software Preserve                   N/A
```

```
Enable or disable the integrated SATA
controller.
This page also shows current state of
SATA devices , including options to
disable ports and configure hot plug
status.
Note: Only includes integrated Chipset
ports, not 3rd party IC SATA ports.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

☞ Integrated SATA Controller. (Intel® Z87 Chipset)

Enables or disables the integrated SATA controllers. (Default: Enabled)

☞ SATA Mode Selection (Intel® Z87 Chipset)

Enables or disables RAID for the SATA controllers or configures the SATA controllers to AHCI mode.

⏩ IDE	Configures the SATA controller to IDE mode.
⏩ RAID	Enables RAID for the SATA controller.
⏩ AHCI	Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)

▶ Serial ATA Port 0/1/2/3/4/5

☞ Port 0/1/2/3/4/5

Enables or disables each SATA port. (Default: Enabled)

☞ Hot plug

Enables or disable the hot plug capability for each SATA port. (Default: Disabled)

☞ **External SATA**

Enables or disables support for external SATA devices. (Default: Disabled)

▸ **Intel(R) Thunderbolt**

This sub-menu provides Thurderbolt related information and configuration options.

▸ **Super IO Configuration**

This section provides information on the super I/O chip and allows you to configure the serial port.

☞ **Serial Port A**

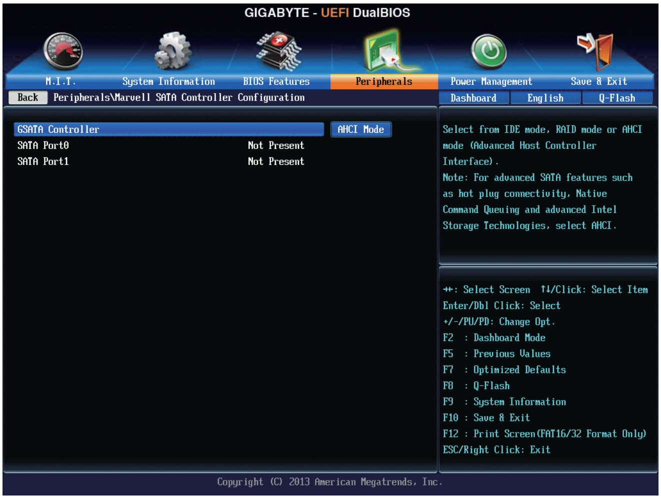
Enables or disables the onboard serial port. (Default: Enabled)

▸ **Intel(R) Smart Connect Technology**

☞ **ISCT Support**

Enables or disables Intel® Smart Connect Technology. (Default: Disabled)

Marvell ATA Controller Configuration



```
Peripherals\Marvell SATA Controller Configuration

GSATA Controller                                  AHCI Mode
SATA Port0                              Not Present
SATA Port1                              Not Present
```

```
Select from IDE mode, RAID mode or AHCI
mode (Advanced Host Controller
Interface).
Note: For advanced SATA features such
as hot plug connectivity, Native
Command Queuing and advanced Intel
Storage Technologies, select AHCI.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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GSATA Controller (Marvell® 88SE9172 Chip, GSATA3 6/7 connectors)

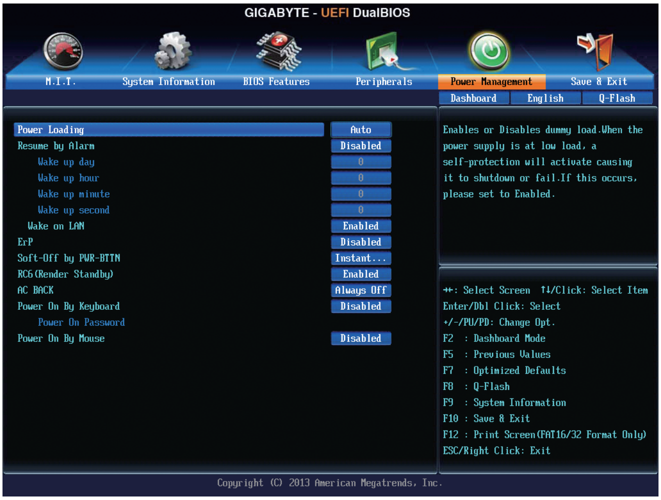
Enables or disables RAID for the SATA controllers integrated in the Marvell® 88SE9172 chip or configures the SATA controllers to AHCI mode. The area below displays the current status of each SATA port.

►► IDE Mode	Disables RAID for the SATA controllers and configures the SATA controllers to IDE mode.
►► AHCI Mode	Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
►► RAID Mode	Enables RAID for the SATA controllers.
►► Disabled	Disables this function.

Intel(R) Ethernet Network Connection

This sub-menu provides information on LAN configuration and related configuration options.

2-7 Power Management



```
Power Loading                 Auto
Resume by Alarm               Disabled
    Wake up day               0
    Wake up hour              0
    Wake up minute            0
    Wake up second            0
  Wake on LAN                 Enabled
ErP                           Disabled
Soft-Off by PWR-BTTN          Instant...
RC6(Render Standby)           Enabled
AC BACK                       Always Off
Power On By Keyboard          Disabled
    Power On Password
Power On By Mouse             Disabled
```

```
Enables or Disables dummy load.When the
power supply is at low load, a
self-protection will activate causing
it to shutdown or fail.If this occurs,
please set to Enabled.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

☞ Power Loading

Enables or disables dummy load. When the power supply is at low load, a self-protection will activate causing it to shutdown or fail. If this occurs, please set to **Enabled**. **Auto** lets the BIOS automatically configur this setting.(Default:Auto)

☞ Resume by Alarm

Determines whether to power on the system at a desired time. (Default: Disabled)

If enabled, set the date and time as following:

- ▸▸ Wake up day: Turn on the system at a specific time on each day or on a specific day in a month.
- ▸▸ Wake up hour/minute/second: Set the time at which the system will be powered on automatically.

Note: When using this function, avoid inadequate shutdown from the operating system or removal of the AC power, or the settings may not be effective.

☞ Wake on LAN

Enables or disables the wake on LAN function. (Default: Enabled)

☞ ErP

Determines whether to let the system consume least power in S5 (shutdown) state. (Default: Disabled)

Note: When this item is set to **Enabled**, the following functions will become unavailable: PME event wake up, power on by mouse, power on by keyboard, and wake on LAN.

☞ Soft-Off by PWR-BTTN

Configures the way to turn off the computer in MS-DOS mode using the power button.

▸▸ Instant-Off	Press the power button and then the system will be turned off instantly. (Default)
▸▸ Delay 4 Sec	Press and hold the power button for 4 seconds to turn off the system. If the power button is pressed for less than 4 seconds, the system will enter suspend mode.

☞ RC6(Render Standby)

Allows you to determine whether to let the onboard graphics enter standby mode to decrease power consumption. (Default: Enabled)

AC BACK

Determines the state of the system after the return of power from an AC power loss.

Always Off	The system stays off upon the return of the AC power. (Default)
Always On	The system is turned on upon the return of the AC power.
Memory	The system returns to its last known awake state upon the return of the AC power.

Power On By Keyboard

Allows the system to be turned on by a PS/2 keyboard wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

Disabled	Disables this function. (Default)
Any Key	Press any key to turn on the system.
Keyboard 98	Press POWER button on the Windows 98 keyboard to turn on the system.
Password	Set a password with 1~5 characters to turn on the system.

Power On Password

Set the password when **Power On By Keyboard** is set to **Password**.

Press <Enter> on this item and set a password with up to 5 characters and then press <Enter> to accept. To turn on the system, enter the password and press <Enter>.

Note: To cancel the password, press <Enter> on this item. When prompted for the password, press <Enter> again without entering the password to clear the password settings.

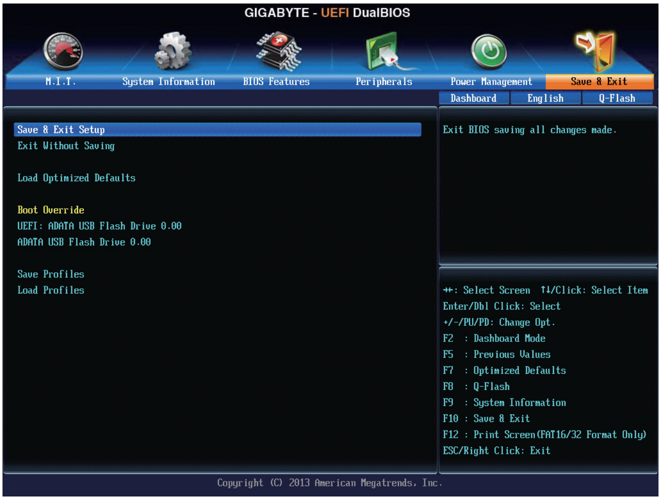
Power On By Mouse

Allows the system to be turned on by a PS/2 mouse wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

Disabled	Disables this function. (Default)
Move	Move the mouse to turn on the system.
Double Click	Double click on left button on the mouse to turn on the system.

2-8 Save & Exit


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash
Save & Exit Setup
Exit Without Saving
Load Optimized Defaults
Boot Override
UEFI: ADATA USB Flash Drive 0.00
ADATA USB Flash Drive 0.00
Save Profiles
Load Profiles

Exit BIOS saving all changes made.

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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☞ Save & Exit Setup

Press <Enter> on this item and select **Yes**. This saves the changes to the CMOS and exits the BIOS Setup program. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

☞ Exit Without Saving

Press <Enter> on this item and select **Yes**. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

☞ Load Optimized Defaults

Press <Enter> on this item and select **Yes** to load the optimal BIOS default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.

☞ Boot Override

Allows you to select a device to boot immediately. Press <Enter> on the device you select and select **Yes** to confirm. Your system will restart automatically and boot from that device.

☞ Save Profiles

This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles and save as Setup Profile 1~ Setup Profile 8. Press <Enter> to complete. Or you can select **Select File in HDD/USB/FDD** to save the profile to your storage device.

☞ Load Profiles

If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load and then press <Enter> to complete. You can select **Select File in HDD/USB/FDD** to input the profile previously created from your storage device or load the profile automatically created by the BIOS, such as reverting the BIOS settings to the last settings that worked properly (last known good record).

Chapter 3 Configuring SATA Hard Drive(s)

RAID Levels

	RAID 0	RAID 1	RAID 5	RAID 10
Minimum Number of Hard Drives	≥2	2	≥3	≥4
Array Capacity	Number of hard drives * Size of the smallest drive	Size of the smallest drive	(Number of hard drives -1) * Size of the smallest drive	(Number of hard drives/2) * Size of the smallest drive
Fault Tolerance	No	Yes	Yes	Yes

To configure SATA hard drive(s), follow the steps below:

A. Install SATA hard drive(s) in your computer.

B. Configure SATA controller mode in BIOS Setup.

C. Configure a RAID array in RAID BIOS. (Note 1)

D. Install the SATA RAID/AHCI driver and operating system. (Note 2)

Before you begin

Please prepare:

- At least two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID, you may prepare only one hard drive.
- Windows 8/7 setup disk.
- Motherboard driver disk.
- A USB thumb drive

3-1 Configuring Intel® Z87 SATA Controllers

A. Installing SATA hard drive(s) in your computer

Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port on the motherboard. If there is more than one SATA controller on your motherboard, refer to "Chapter 1," "Hardware Installation," to identify the SATA controller for the SATA port. (For example, on this motherboard, the SATA3 0~5 ports are supported by the Intel® Z87 Chipset.) Then connect the power connector from your power supply to the hard drive.

(Note 1) Skip this step if you do not want to create RAID array on the SATA controller.

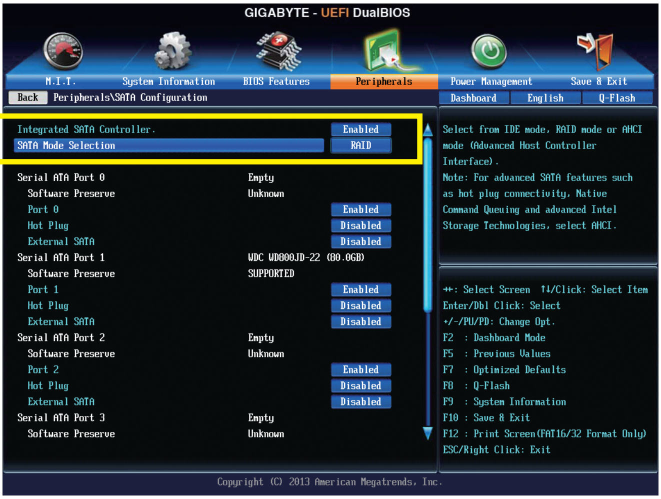
(Note 2) Required when the SATA controller is set to AHCI or RAID mode.

B. Configuring SATA controller mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup.

Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). Go to **Peripherals\SATA Configuration**, make sure **Integrated SATA Controller.** is enabled. To create RAID, set **SATA Mode Selection** to **RAID** (Figure 1). If you do not want to create RAID, set this item to **IDE** or **AHCI**.



```
Integrated SATA Controller.                          Enabled
SATA Mode Selection                                  RAID

Serial ATA Port 0                Empty
  Software Preserve              Unknown
  Port 0                                             Enabled
  Hot Plug                                           Disabled
  External SATA                                      Disabled
Serial ATA Port 1                WDC WD800JD-22 (80.0GB)
  Software Preserve              SUPPORTED
  Port 1                                             Enabled
  Hot Plug                                           Disabled
  External SATA                                      Disabled
Serial ATA Port 2                Empty
  Software Preserve              Unknown
  Port 2                                             Enabled
  Hot Plug                                           Disabled
  External SATA                                      Disabled
Serial ATA Port 3                Empty
  Software Preserve              Unknown
```

```
Select from IDE mode, RAID mode or AHCI
mode (Advanced Host Controller
Interface).
Note: For advanced SATA features such
as hot plug connectivity, Native
Command Queuing and advanced Intel
Storage Technologies, select AHCI.
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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Figure 1

Step 2:

If you want to configure UEFI RAID, follow the steps in "C-1." To enter the legacy RAID ROM, save the settings and exit BIOS Setup. Refer to "C-2" for more information.

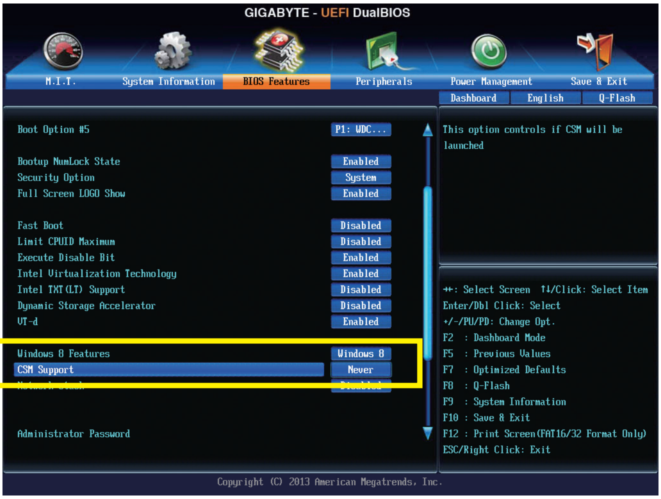
The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C-1. UEFI RAID Configuration

This mode supports Windows 8 64-bit installation only.

Step 1:

In BIOS Setup, go to **BIOS Features** and set **Windows 8 Features** to **Windows 8** and **CSM Support** to **Never** (Figure 2). Save the changes and exit BIOS Setup.


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash

```
Boot Option #5                          P1: WDC...

Bootup NumLock State                    Enabled
Security Option                         System
Full Screen LOGO Show                   Enabled

Fast Boot                               Disabled
Limit CPUID Maximum                     Disabled
Execute Disable Bit                     Enabled
Intel Virtualization Technology         Enabled
Intel TXT(LT) Support                   Disabled
Dynamic Storage Accelerator             Disabled
VT-d                                    Enabled

Windows 8 Features                      Windows 8
CSM Support                             Never
Network Stack                           Disabled


Administrator Password
```

```
This option controls if CSM will be
launched
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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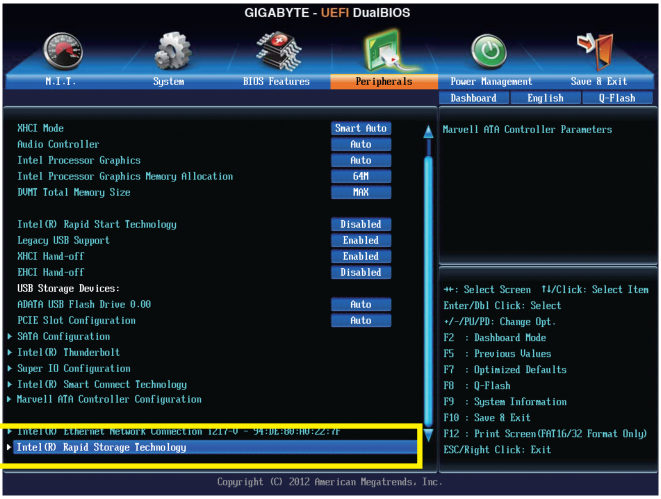
Figure 2

Step 2:

After the system reboot, enter BIOS Setup again. Then enter the **Peripherals\Intel(R) Rapid Storage Technology** sub-menu (Figure 3).


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash

```
XHCI Mode                                      Smart Auto
Audio Controller                               Auto
Intel Processor Graphics                       Auto
Intel Processor Graphics Memory Allocation     64M
DVMT Total Memory Size                         MAX

Intel(R) Rapid Start Technology                Disabled
Legacy USB Support                             Enabled
XHCI Hand-off                                  Enabled
EHCI Hand-off                                  Disabled
USB Storage Devices:
ADATA USB Flash Drive 0.00                     Auto
PCIE Slot Configuration                        Auto
▶ SATA Configuration
▶ Intel(R) Thunderbolt
▶ Super IO Configuration
▶ Intel(R) Smart Connect Technology
▶ Marvell ATA Controller Configuration

▶ Intel(R) Ethernet Network Connection I217-V - 94:DE:80:A0:22:7F
▶ Intel(R) Rapid Storage Technology
```

```
Marvell ATA Controller Parameters
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

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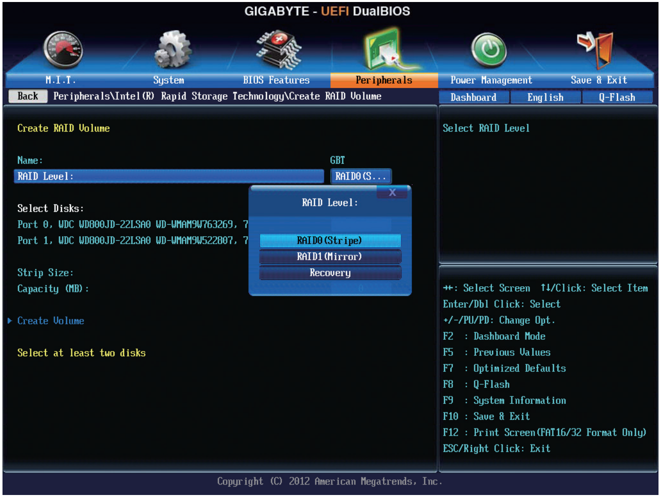
Figure 3

Step 3:

On the **Intel(R) Rapid Storage Technology** menu, press <Enter> on **Create RAID Volume** to enter the **Create RAID Volume** screen. Enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 4). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Next, use the down arrow key to move to **Select Disks**.


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Peripherals\Intel(R) Rapid Storage Technology\Create RAID Volume
Dashboard
English
Q-Flash
RAID Level:
X
RAID0(Stripe)
RAID1(Mirror)
Recovery

Create RAID Volume

Name: GBT
RAID Level: RAID0(S...

Select Disks:
Port 0, WDC WD800JD-22LSA0 WD-WMAM9W763269, 7
Port 1, WDC WD800JD-22LSA0 WD-WMAM9W522807, 7

Strip Size:
Capacity (MB):

▸ Create Volume

Select at least two disks

Select RAID Level

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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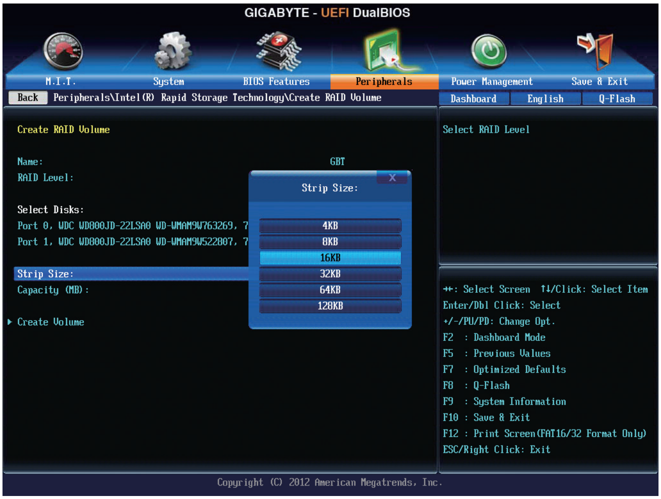
Figure 4

Step 4:

Under **Select Disks** item, select the hard drives to be included in the RAID array. Press the <Space> key on the hard drives to be selected (selected hard drives are marked with "X"). Then set the stripe block size (Figure 5). The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, set the volume capacity.


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Peripherals\Intel(R) Rapid Storage Technology\Create RAID Volume
Dashboard
English
Q-Flash
Strip Size:
X
4KB
8KB
16KB
32KB
64KB
128KB

Create RAID Volume

Name: GBT
RAID Level:

Select Disks:
Port 0, WDC WD800JD-22LSA0 WD-WMAM9W763269, 7
Port 1, WDC WD800JD-22LSA0 WD-WMAM9W522807, 7

Strip Size:
Capacity (MB):

▸ Create Volume

Select RAID Level

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

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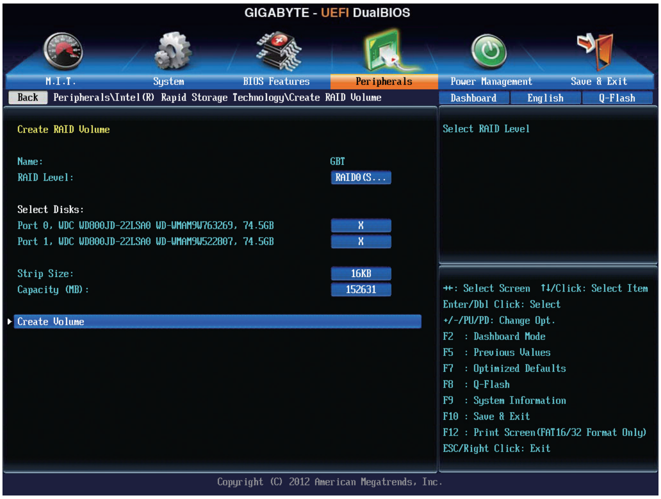
Figure 5

Step 5:
After setting the capacity, move to **Create Volume** and press <Enter> to begin. (Figure 6)


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Dashboard
English
Q-Flash
→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
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Peripherals\Intel(R) Rapid Storage Technology\Create RAID Volume

Create RAID Volume

Name: GBT
RAID Level: RAID0(S...

Select Disks:
Port 0, WDC WD800JD-22LSA0 WD-WMAM9W763269, 74.5GB X
Port 1, WDC WD800JD-22LSA0 WD-WMAM9W522807, 74.5GB X

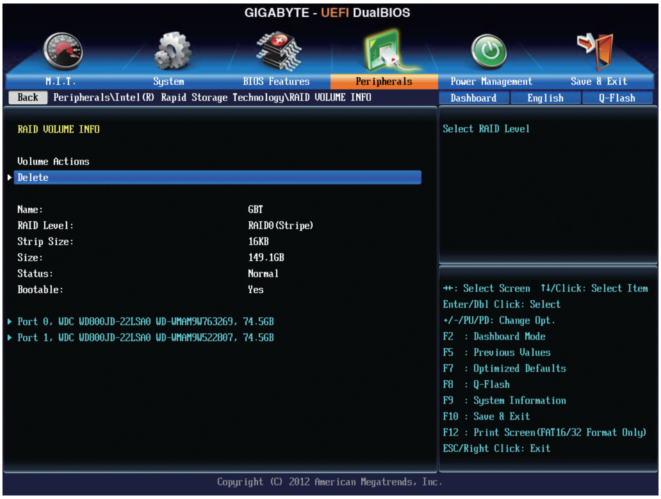
Strip Size: 16KB
Capacity (MB): 152631

Create Volume

Select RAID Level

Figure 6

After completing, you'll be brought back to the **Intel(R) Rapid Storage Technology** screen. Under **RAID Volumes** you can see the new RAID volume. To see more detailed information, press <Enter> on the volume to check for information on RAID level, stripe block size, array name, and array capacity, etc. (Figure 7)


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Dashboard
English
Q-Flash
→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
Copyright (C) 2012 American Megatrends, Inc.

Peripherals\Intel(R) Rapid Storage Technology\RAID VOLUME INFO

RAID VOLUME INFO

Volume Actions
Delete

Name: GBT
RAID Level: RAID0(Stripe)
Strip Size: 16KB
Size: 149.1GB
Status: Normal
Bootable: Yes

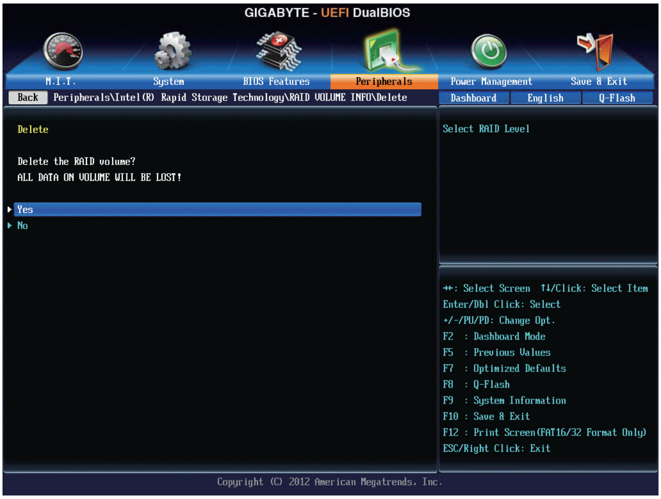
Port 0, WDC WD800JD-22LSA0 WD-WMAM9W763269, 74.5GB
Port 1, WDC WD800JD-22LSA0 WD-WMAM9W522807, 74.5GB

Select RAID Level

Figure 7

Delete RAID Volume

To delete a RAID array, press <Enter> on the volume to be deleted on the **Intel(R) Rapid Storage Technology** screen. After entering the **RAID VOLUME INFO** screen, press <Enter> on **Delete** to enter the **Delete** screen. Press <Enter> on **Yes** (Figure 8).


GIGABYTE - UEFI DualBIOS
M.I.T.
System
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Peripherals\Intel(R) Rapid Storage Technology\RAID VOLUME INFO\Delete
Dashboard
English
Q-Flash

```
Delete

Delete the RAID volume?
ALL DATA ON VOLUME WILL BE LOST!

▸ Yes
▸ No
```

```
Select RAID Level
```

```
→←: Select Screen  ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2  : Dashboard Mode
F5  : Previous Values
F7  : Optimized Defaults
F8  : Q-Flash
F9  : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit
```

```
Copyright (C) 2012 American Megatrends, Inc.
```

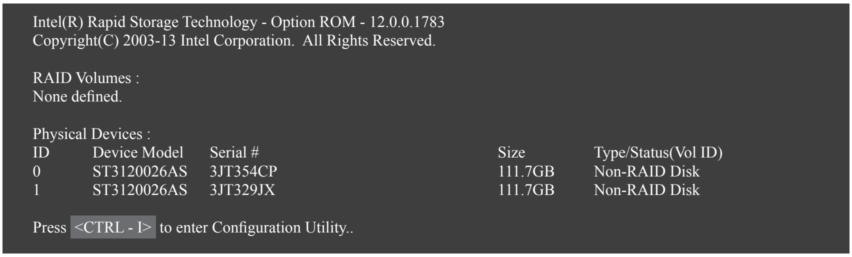
Figure 8

C-2. Configuring Legacy RAID ROM

Enter the Intel® legacy RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Step 1:

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-I> to enter Configuration Utility" (Figure 9). Press <Ctrl> + <I> to enter the RAID Configuration Utility.



```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

RAID Volumes :
None defined.

Physical Devices :
ID      Device Model    Serial #                          Size        Type/Status(Vol ID)
0       ST3120026AS     3JT354CP                          111.7GB     Non-RAID Disk
1       ST3120026AS     3JT329JX                          111.7GB     Non-RAID Disk

Press <CTRL - I> to enter Configuration Utility..
```

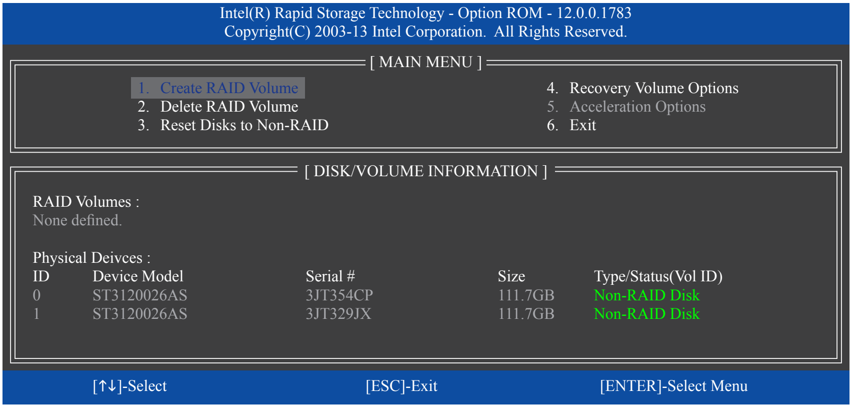
Figure 9

Step 2:

After you press <Ctrl> + <I>, the **MAIN MENU** screen will appear (Figure 10).

Create RAID Volume

If you want to create a RAID array, select **Create RAID Volume** in **MAIN MENU** and press <Enter>.

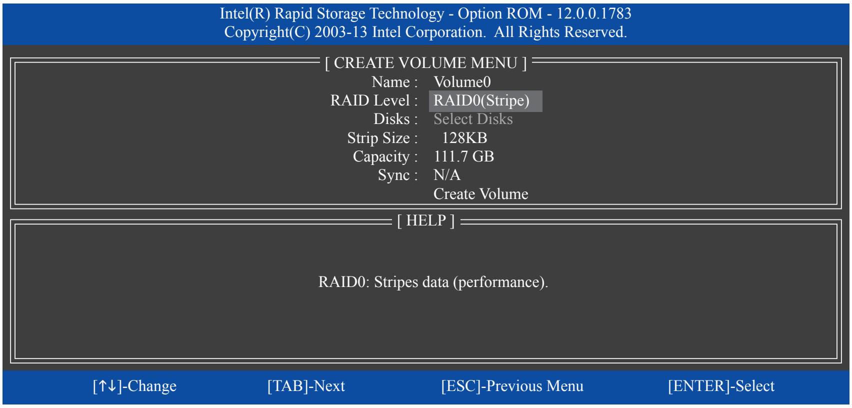


```
              Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
               Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

                                   [ MAIN MENU ]
                1.  Create RAID Volume                      4.  Recovery Volume Options
                2.  Delete RAID Volume                      5.  Acceleration Options
                3.  Reset Disks to Non-RAID                 6.  Exit

                           [ DISK/VOLUME INFORMATION ]
RAID Volumes :
None defined.

Physical Deivces :
ID      Device Model           Serial #            Size        Type/Status(Vol ID)
0       ST3120026AS            3JT354CP            111.7GB     Non-RAID Disk
1       ST3120026AS            3JT329JX            111.7GB     Non-RAID Disk

        [↑↓]-Select                 [ESC]-Exit                 [ENTER]-Select Menu
```

Figure 10

Step 3:

After entering the **CREATE VOLUME MENU** screen, enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 11). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Press <Enter> to proceed.

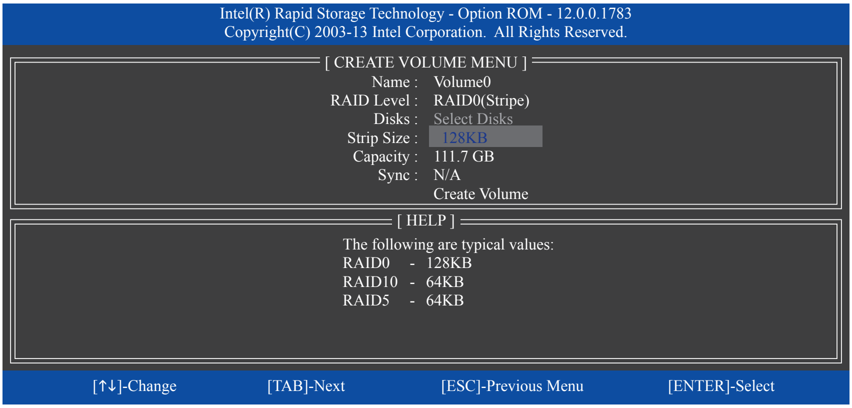


```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

[ CREATE VOLUME MENU ]
       Name :  Volume0
 RAID Level :  RAID0(Stripe)
      Disks :  Select Disks
  Strip Size :   128KB
   Capacity :  111.7 GB
       Sync :  N/A
               Create Volume

[ HELP ]

RAID0: Stripes data (performance).

[↑↓]-Change    [TAB]-Next    [ESC]-Previous Menu    [ENTER]-Select
```

Figure 11

Step 4:

Under **Disks** item, select the hard drives to be included in the RAID array. If only two hard drives are installed, they will be automatically assigned to the array. Set the stripe block size (Figure 12) if necessary. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, press <Enter>.

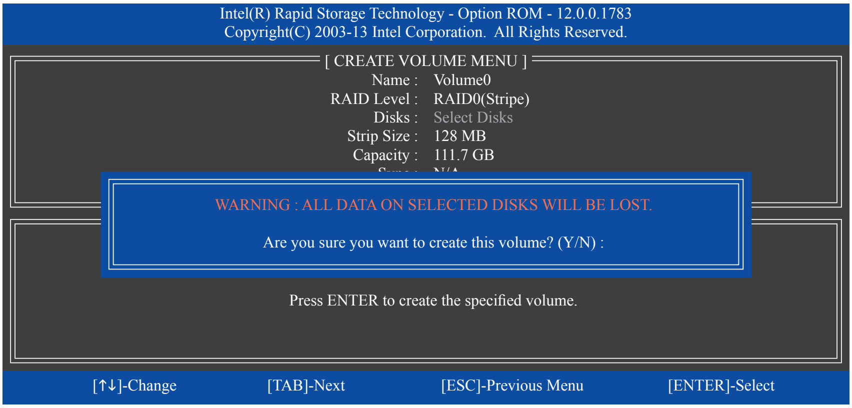


```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

[ CREATE VOLUME MENU ]
       Name :  Volume0
 RAID Level :  RAID0(Stripe)
      Disks :  Select Disks
  Strip Size :   128KB
   Capacity :  111.7 GB
       Sync :  N/A
               Create Volume

[ HELP ]
The following are typical values:
RAID0   -  128KB
RAID10  -  64KB
RAID5   -  64KB

[↑↓]-Change    [TAB]-Next    [ESC]-Previous Menu    [ENTER]-Select
```

Figure 12

Step 5:

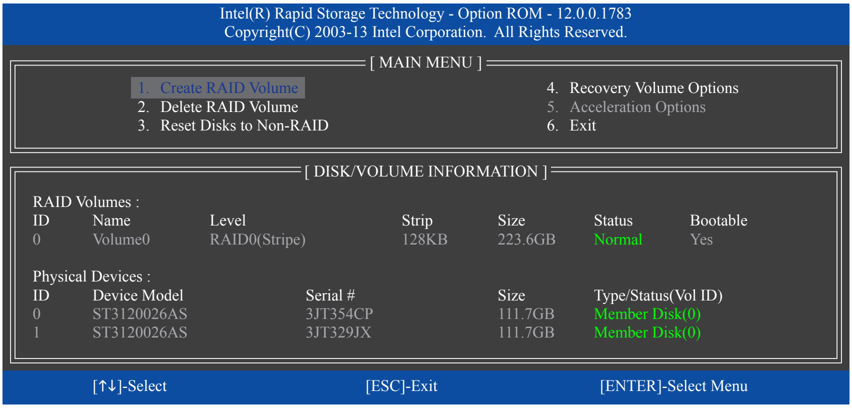
Enter the array capacity and press <Enter>. Finally press <Enter> on the **Create Volume** item to begin creating the RAID array. When prompted to confirm whether to create this volume, press <Y> to confirm or <N> to cancel (Figure 13).



```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

[ CREATE VOLUME MENU ]
       Name :   Volume0
 RAID Level :   RAID0(Stripe)
      Disks :   Select Disks
 Strip Size :   128 MB
   Capacity :   111.7 GB

WARNING : ALL DATA ON SELECTED DISKS WILL BE LOST.

Are you sure you want to create this volume? (Y/N) :

Press ENTER to create the specified volume.

[↑↓]-Change    [TAB]-Next    [ESC]-Previous Menu    [ENTER]-Select
```

Figure 13

When completed, you can see detailed information about the RAID array in the **DISK/VOLUME INFORMATION** section, including the RAID level, stripe block size, array name, and array capacity, etc. (Figure 14)



```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

[ MAIN MENU ]
  1.  Create RAID Volume            4.  Recovery Volume Options
  2.  Delete RAID Volume            5.  Acceleration Options
  3.  Reset Disks to Non-RAID       6.  Exit

[ DISK/VOLUME INFORMATION ]
RAID Volumes :
ID   Name       Level            Strip   Size      Status   Bootable
0    Volume0    RAID0(Stripe)    128KB   223.6GB   Normal   Yes

Physical Devices :
ID   Device Model    Serial #     Size      Type/Status(Vol ID)
0    ST3120026AS     3JT354CP     111.7GB   Member Disk(0)
1    ST3120026AS     3JT329JX     111.7GB   Member Disk(0)

[↑↓]-Select          [ESC]-Exit          [ENTER]-Select Menu
```

Figure 14

To exit the RAID BIOS utility, press <Esc> or select **6. Exit** in **MAIN MENU**.

Now, you can proceed to install the SATA RAID/AHCI driver and operating system.

Recovery Volume Options

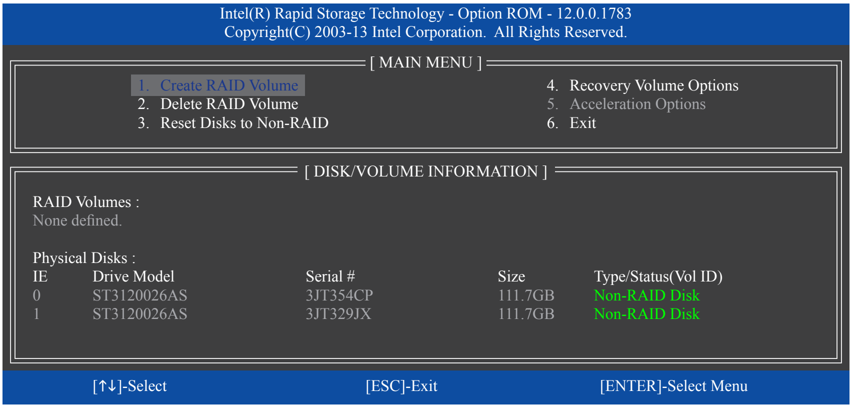
Intel® Rapid Recover Technology provides data protection by allowing users to easily restore data and system operation using a designated recovery drive. With the Rapid Recovery Technology, which employs RAID 1 functionality, users can copy the data from the master drive to the recovery drive; if needed, the data on the recovery drive can be restored back to the master drive.

Before you begin:

- The recovery drive must have equal or greater capacity than the master drive.
- A recovery volume can be created with two hard drives only. A recovery volume and a RAID array cannot co-exist in the system at the same time, that is, if you have already created a recovery volume, you are unable to create a RAID array.
- By default, only the master drive can be viewed in the operating system; the recovery drive is hidden.

Step 1:

Select **Create RAID Volume** in **MAIN MENU** and press <Enter> (Figure 15).

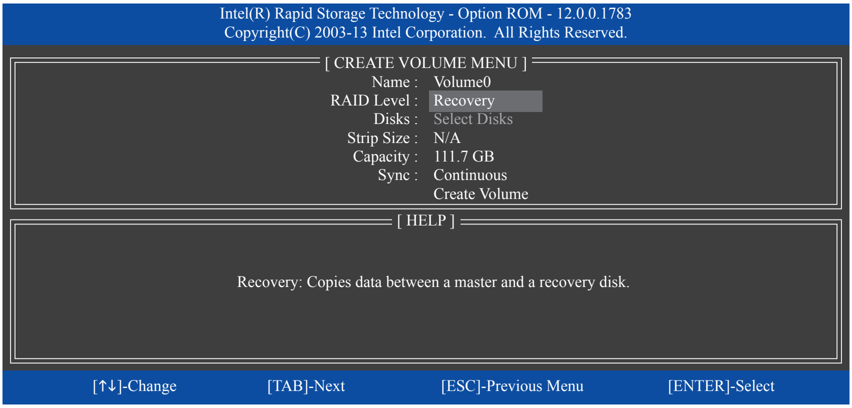


```
              Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
              Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

                                   [ MAIN MENU ]
          1.  Create RAID Volume                     4.  Recovery Volume Options
          2.  Delete RAID Volume                     5.  Acceleration Options
          3.  Reset Disks to Non-RAID                6.  Exit

                            [ DISK/VOLUME INFORMATION ]
   RAID Volumes :
   None defined.

   Physical Disks :
   IE      Drive Model           Serial #            Size       Type/Status(Vol ID)
   0       ST3120026AS           3JT354CP            111.7GB    Non-RAID Disk
   1       ST3120026AS           3JT329JX            111.7GB    Non-RAID Disk

          [↑↓]-Select                 [ESC]-Exit                [ENTER]-Select Menu
```

Figure 15

Step 2:

After entering the volume name, select **Recovery** under the **RAID Level** item and press <Enter> (Figure 16).

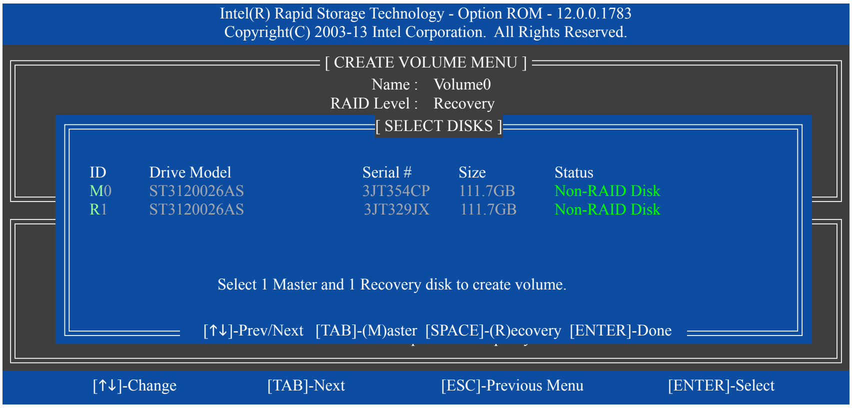


```
              Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
              Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

                               [ CREATE VOLUME MENU ]
                                  Name :  Volume0
                            RAID Level :  Recovery
                                 Disks :  Select Disks
                             Strip Size :  N/A
                              Capacity :  111.7 GB
                                  Sync :  Continuous
                                          Create Volume

                                      [ HELP ]

                  Recovery: Copies data between a master and a recovery disk.

          [↑↓]-Change        [TAB]-Next        [ESC]-Previous Menu        [ENTER]-Select
```

Figure 16

Step 3:

Press <Enter> under the **Select Disks** item. In the **SELECT DISKS** box, press <Tab> on the hard drive you want to use for the master drive and press <Space> on the hard drive you want to use for the recovery drive. (Make sure the recovery drive has equal or larger capacity than the master drive.) Then press <Enter> to confirm (Figure 17).

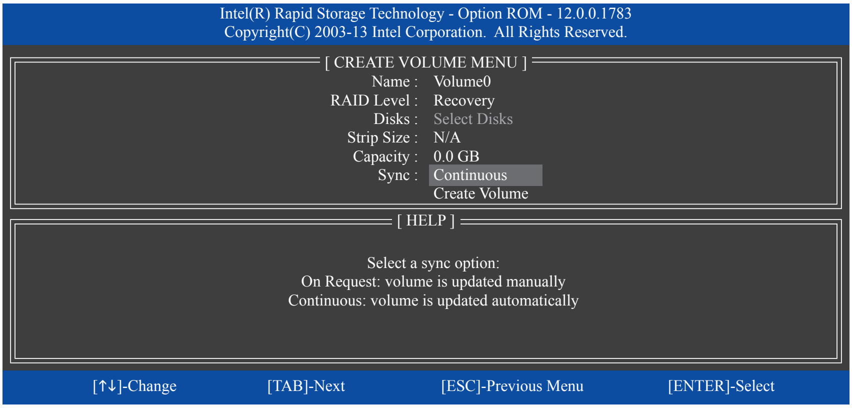


```
            Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
             Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

                          [ CREATE VOLUME MENU ]
                            Name :   Volume0
                      RAID Level :   Recovery
                               [ SELECT DISKS ]

  ID    Drive Model              Serial #    Size       Status
  M0    ST3120026AS              3JT354CP    111.7GB    Non-RAID Disk
  R1    ST3120026AS              3JT329JX    111.7GB    Non-RAID Disk

              Select 1 Master and 1 Recovery disk to create volume.

      [↑↓]-Prev/Next  [TAB]-(M)aster  [SPACE]-(R)ecovery  [ENTER]-Done

   [↑↓]-Change       [TAB]-Next        [ESC]-Previous Menu        [ENTER]-Select
```

Figure 17

Step 4:

Under **Sync**, select **Continuous** or **On Request** (Figure 18). When set to **Continuous**, changes made to the data on the master drive will be automatically and continuously copied to the recovery drive when both hard drives are installed in the system. **On Request** allows users to update data from the master drive to the recovery drive manually using the Intel® Rapid Storage Technology utility in the operating system. **On Request** also allows users to restore the master drive to a previous state.



```
            Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
             Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

                          [ CREATE VOLUME MENU ]
                            Name :   Volume0
                      RAID Level :   Recovery
                           Disks :   Select Disks
                      Strip Size :   N/A
                        Capacity :   0.0 GB
                            Sync :   Continuous
                                     Create Volume

                                 [ HELP ]

                             Select a sync option:
                    On Request: volume is updated manually
                  Continuous: volume is updated automatically

   [↑↓]-Change       [TAB]-Next        [ESC]-Previous Menu        [ENTER]-Select
```

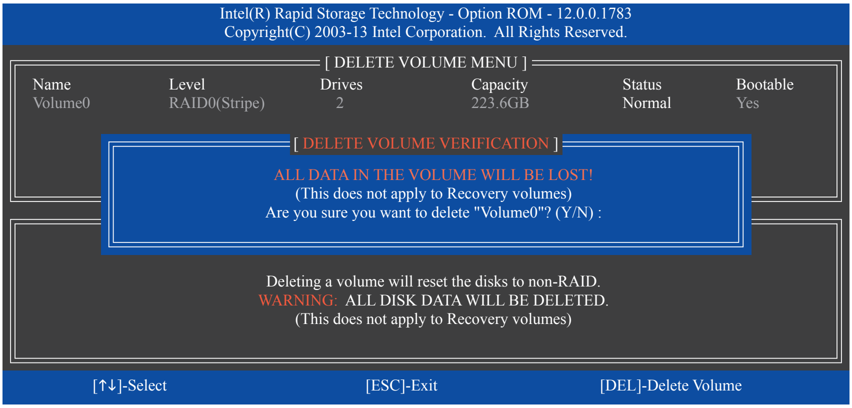
Figure 18

Step 5:

Finally press <Enter> on the **Create Volume** item to begin creating the Recovery Volume and follow the on-screen instructions to complete.

Delete RAID Volume

To delete a RAID array, select **Delete RAID Volume** in **MAIN MENU** and press <Enter>. In the **DELETE VOLUME MENU** section, use the up or down arrow key to select the array to be deleted and press <Delete>. When prompted to confirm your selection (Figure 19), press <Y> to confirm or <N> to abort.



```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

[ DELETE VOLUME MENU ]
Name        Level           Drives      Capacity    Status      Bootable
Volume0     RAID0(Stripe)     2         223.6GB     Normal      Yes

[ DELETE VOLUME VERIFICATION ]
ALL DATA IN THE VOLUME WILL BE LOST!
(This does not apply to Recovery volumes)
Are you sure you want to delete "Volume0"? (Y/N) :

Deleting a volume will reset the disks to non-RAID.
WARNING:  ALL DISK DATA WILL BE DELETED.
(This does not apply to Recovery volumes)

[↑↓]-Select              [ESC]-Exit              [DEL]-Delete Volume
```

Figure 19

Acceleration Options

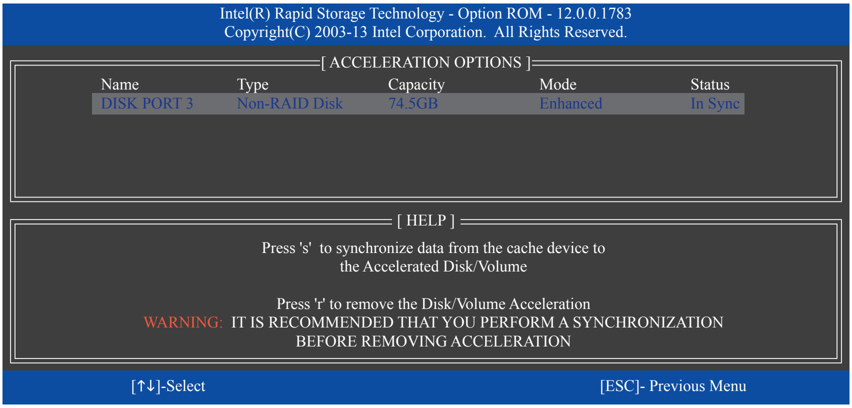
This option allows you to view the status of your accelerated drive/volume (Figure 20) created using the Intel® IRST utility. In case you are unable to run the Intel® IRST utility due to an application error or operating system issue, you will need to remove acceleration or manually enable synchronization (Maximized mode only) using this option in the RAID ROM utility.

Steps:

Select **Acceleration Options** in **MAIN MENU** and press <Enter>.

To remove the acceleration, select the accelerated drive/volume, press <R>, and press <Y> to confirm.

To synchronize data from the cache device to the accelerated drive/volume, press <S> and press <Y> to confirm.



```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

[ ACCELERATION OPTIONS ]
Name            Type            Capacity        Mode            Status
DISK PORT 3     Non-RAID Disk   74.5GB          Enhanced        In Sync

[ HELP ]
Press 's'  to synchronize data from the cache device to
the Accelerated Disk/Volume

Press 'r' to remove the Disk/Volume Acceleration
WARNING:  IT IS RECOMMENDED THAT YOU PERFORM A SYNCHRONIZATION
BEFORE REMOVING ACCELERATION

[↑↓]-Select                                  [ESC]- Previous Menu
```

Figure 20

3-2 Configuring Marvell® 88SE9172 SATA Controller

A. Installing SATA hard drive(s) in your computer

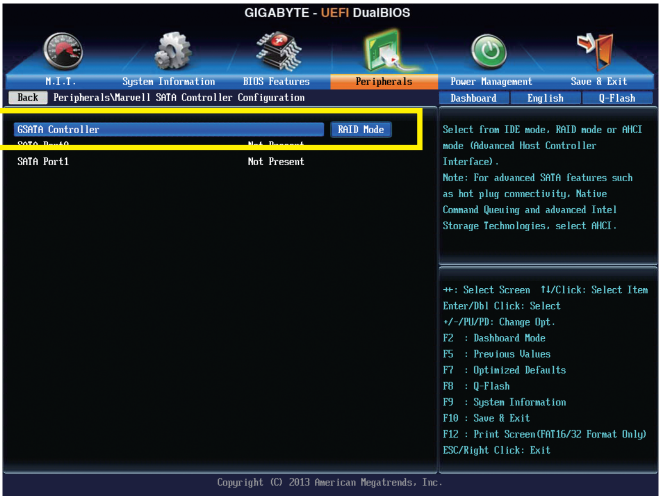
Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port on the motherboard. The Marvell® 88SE9172 SATA controller controls the onboard GSATA3 6/7 connectors . Then connect the power connector from your power supply to the hard drive.

B. Configuring SATA controller and RAID mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup.

Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST. To create RAID, go to **Peripherals\Marvell ATA Controller Configuration** and make sure **GSATA Controller** is set to **RAID Mode** (Figure 1). If you do not want to create RAID, set this item to **IDE Mode** or **AHCI Mode**.


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Back
Peripherals\Marvell SATA Controller Configuration
Dashboard
English
Q-Flash

GSATA Controller RAID Mode
SATA Port0 Not Present
SATA Port1 Not Present

Select from IDE mode, RAID mode or AHCI mode (Advanced Host Controller Interface).
Note: For advanced SATA features such as hot plug connectivity, Native Command Queuing and advanced Intel Storage Technologies, select AHCI.

→←: Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

Copyright (C) 2013 American Megatrends, Inc.

Figure 1

Step 2:

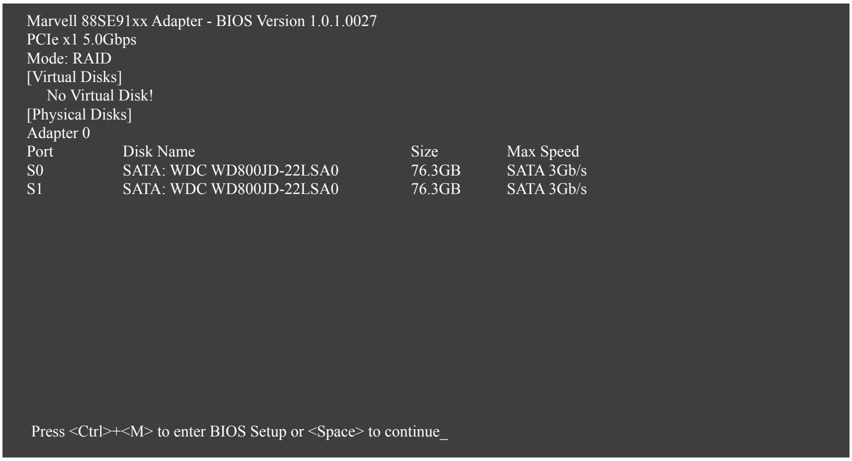
Save changes and exit BIOS Setup.

The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C. Configuring a RAID array in RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed to the installation of Windows operating system for a non-RAID configuration.

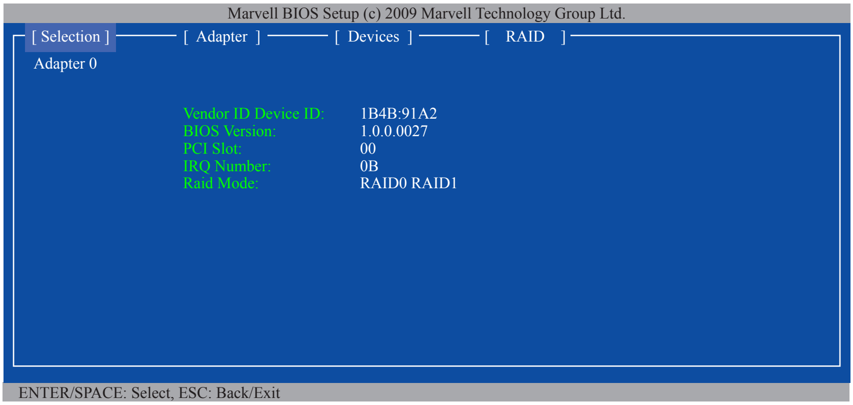
After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl>+<M> to enter BIOS Setup or <Space> to continue" (Figure 2). Press <Ctrl> + <M> to enter the RAID setup utility.



```
Marvell 88SE91xx Adapter - BIOS Version 1.0.1.0027
PCIe x1 5.0Gbps
Mode: RAID
[Virtual Disks]
    No Virtual Disk!
[Physical Disks]
Adapter 0
Port          Disk Name                           Size         Max Speed
S0            SATA: WDC WD800JD-22LSA0            76.3GB       SATA 3Gb/s
S1            SATA: WDC WD800JD-22LSA0            76.3GB       SATA 3Gb/s

 Press <Ctrl>+<M> to enter BIOS Setup or <Space> to continue_
```

Figure 2

On the main screen of the RAID setup utility (Figure 3), use the left or right arrow key to move through tabs.

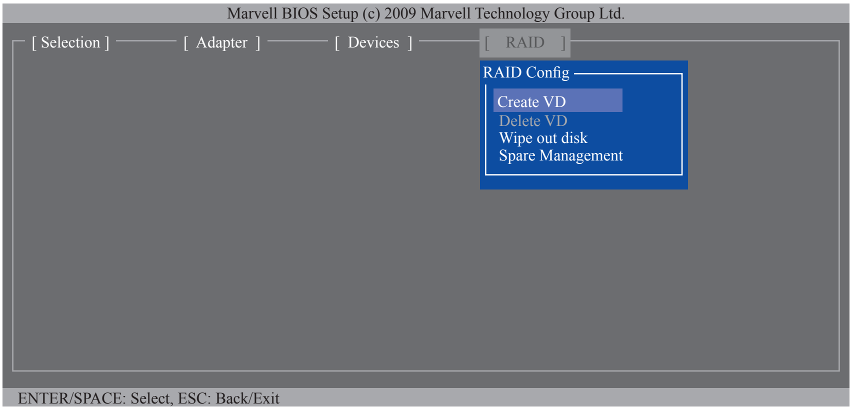


```
Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.

Adapter 0

                      Vendor ID Device ID:       1B4B:91A2
                      BIOS Version:              1.0.0.0027
                      PCI Slot:                  00
                      IRQ Number:                0B
                      Raid Mode:                 RAID0 RAID1

ENTER/SPACE: Select, ESC: Back/Exit
```

Figure 3

Create a RAID Array:

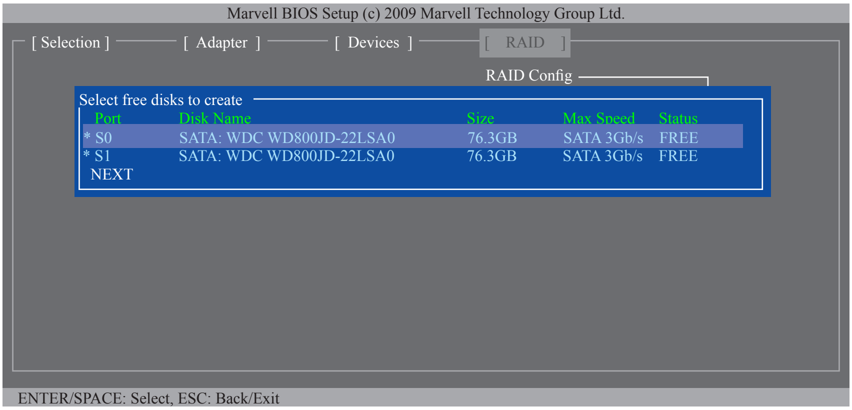
Step 1: On the main screen, press <Enter> on the **RAID** tab. Then the **RAID Config** menu appears (Figure 4). Press <Enter> on the **Create VD** item.



```
Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.
[ Selection ] ──── [ Adapter ] ──── [ Devices ] ──── [ RAID ]
                                                      RAID Config
                                                        Create VD
                                                        Delete VD
                                                        Wipe out disk
                                                        Spare Management
ENTER/SPACE: Select, ESC: Back/Exit
```

Figure 4

Step 2: The next screen displays the two hard drives you installed. Press <Enter> or <Space> on the two hard drives respectively to add them into the RAID array. Selected hard drives are marked with an asterisk (Figure 5). Then press <Enter> on **NEXT**.



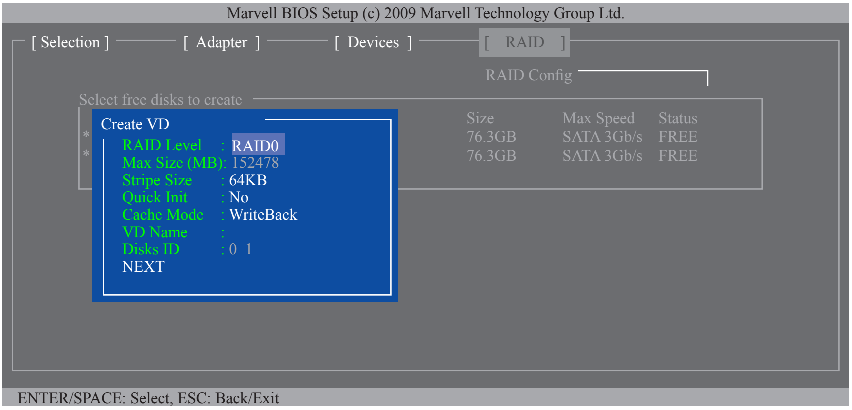
```
Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.
[ Selection ] ──── [ Adapter ] ──── [ Devices ] ──── [ RAID ]
                                                      RAID Config
Select free disks to create
   Port        Disk Name                        Size       Max Speed     Status
 * S0          SATA: WDC WD800JD-22LSA0         76.3GB     SATA 3Gb/s    FREE
 * S1          SATA: WDC WD800JD-22LSA0         76.3GB     SATA 3Gb/s    FREE
   NEXT
ENTER/SPACE: Select, ESC: Back/Exit
```

Figure 5

Step 3: On the **Create VD** menu (Figure 6), use the up or down arrow key to move the selection bar to select an item and press <Enter> to display options. Set the required items in sequence and press the down arrow key to proceed to the next item.

Sequence:

1. **RAID Level:** Select a RAID level. Options include RAID 0 (Stripe) and RAID 1 (Mirror).
2. **Stripe Size:** Select the stripe block size. Options include 32 KB, 64 KB, and 128 KB.
3. **Quick Init:** Select whether to quickly erase old data on the hard drives when creating the array.
4. **Cache Mode:** Select write-back or write-through cache.
5. **VD Name:** Enter an array name with 1~10 letters (letters cannot be special characters).


Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.
[Selection]
[Adapter]
[Devices]
[RAID]
RAID Config
Select free disks to create
Create VD

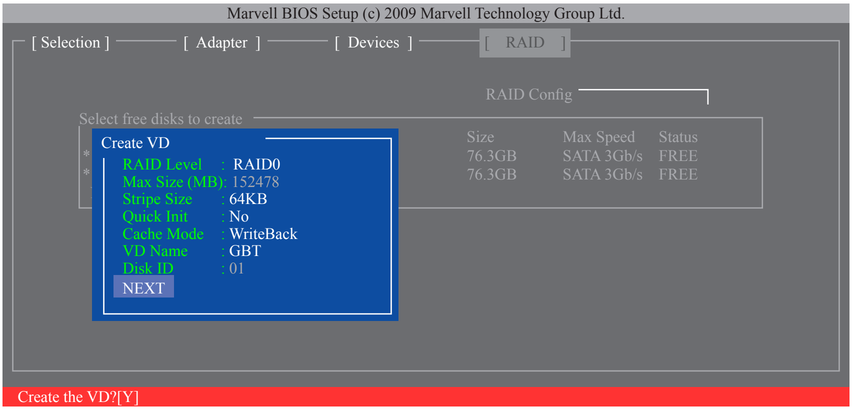
RAID Level : RAID0
Max Size (MB): 152478
Stripe Size : 64KB
Quick Init : No
Cache Mode : WriteBack
VD Name :
Disks ID : 0 1
NEXT

Size	Max Speed	Status
76.3GB	SATA 3Gb/s	FREE
76.3GB	SATA 3Gb/s	FREE

ENTER/SPACE: Select, ESC: Back/Exit

Figure 6

6. **NEXT:** After completing the settings above, move to **NEXT** and press <Enter> to begin creating the array. When prompted to confirm, press <Y> to confirm or <N> to cancel (Figure 7).


Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.
[Selection]
[Adapter]
[Devices]
[RAID]
RAID Config
Select free disks to create
Create VD

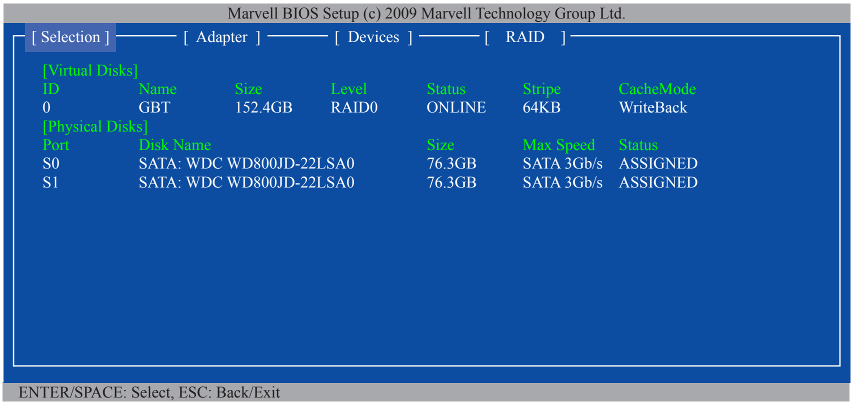
RAID Level : RAID0
Max Size (MB): 152478
Stripe Size : 64KB
Quick Init : No
Cache Mode : WriteBack
VD Name : GBT
Disk ID : 01
NEXT

Size	Max Speed	Status
76.3GB	SATA 3Gb/s	FREE
76.3GB	SATA 3Gb/s	FREE

Create the VD?[Y]

Figure 7

When completed, the **RAID** tab will display the new array (Figure 8).



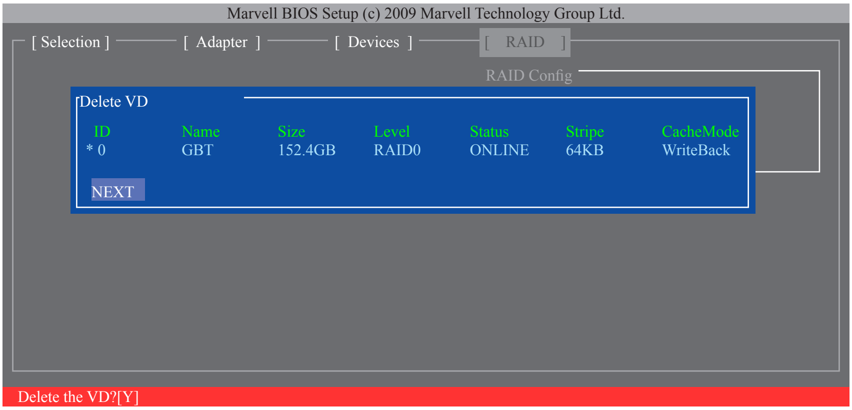
```
Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.
[ Selection ] ──── [ Adapter ] ──── [ Devices ] ──── [  RAID  ]

[Virtual Disks]
ID        Name      Size       Level     Status    Stripe       CacheMode
0         GBT       152.4GB    RAID0     ONLINE    64KB         WriteBack
[Physical Disks]
Port      Disk Name                      Size      Max Speed    Status
S0        SATA: WDC WD800JD-22LSA0       76.3GB    SATA 3Gb/s   ASSIGNED
S1        SATA: WDC WD800JD-22LSA0       76.3GB    SATA 3Gb/s   ASSIGNED

ENTER/SPACE: Select, ESC: Back/Exit
```

Figure 8

To exit the RAID BIOS utility, press <Esc> on the main screen and press <Y> to confirm.
Now, you can proceed to install the operating system.

Delete the RAID Array:

To deleted the existing array, press <Enter> on the **RAID** tab and select **Delete VD**. When the **Delete VD** menu appears, press <Enter> on the array to select it and then press <Enter> on **NEXT**. When prompted, press <Y> to confirm (Figure 9). When the message "Do you want to delete the VD's MBR?" appears, press <Y> to clear the MBR or press other keys to ignore.



```
Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.
[ Selection ] ──── [ Adapter ] ──── [ Devices ] ──── [  RAID  ]
                                                     RAID Config
 Delete VD
   ID       Name     Size      Level    Status    Stripe    CacheMode
 * 0        GBT      152.4GB   RAID0    ONLINE    64KB      WriteBack

  NEXT

Delete the VD?[Y]
```

Figure 9

Use the Marvell® Storage Utility in the Operating System:

With the Marvell® Storage utility, you can set up an array or view the current array status in the operating system. To install the utility, insert the motherboard driver disk, then go to **Application Software\Install Application Software** and select **Marvell Storage Utility** to install. Note: After the installation, you must login the utility with the same account name and password that you use to login the operating system. If you did not set the account password before, click **Login** to enter the Marvell Storage Utility directly. Please note that if you set the hard drive(s) to IDE or AHCI mode, it is normal that you will not see the hard drive(s) in the Marvell Storage Utility.

3-3 Installing the SATA RAID/AHCI Driver and Operating System

With the correct BIOS settings, you are ready to install Windows 8/7.

A. Installing Windows 8/7

For the Intel® Z87:

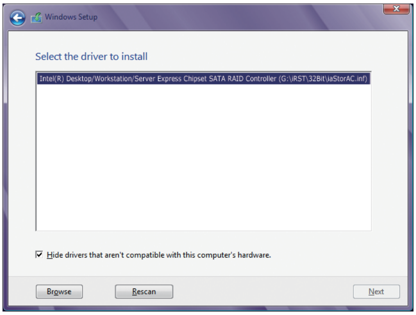
As Windows 7 already include Intel® SATA RAID/AHCI driver, you do not need to install separate RAID/AHCI driver during the Windows installation process. After the operating system is installed, we recommend that you install all required drivers from the motherboard driver disk using "Xpress Install" to ensure system performance and compatibility. To install Windows 8, refer to the steps below:

Step 1:
Copy the **IRST** folder under **BootDrv** in the driver disk to your USB thumb drive.

Step 2:
Boot from the Windows 8 setup disk and perform standard OS installation steps. When the screen requesting you to load the driver appears, select **Browse**.

Step 3:
Insert the USB thumb drive and then browse to the location of the driver. The locations of the drivers are as follows:
Windows 32-bit: \iRST\32Bit
Windows 64-bit: \iRST\64Bit

Step 4:
When a screen as shown in Figure 1 appears, select **Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller** and click **Next** to load the driver and continue the OS installation.



Select the driver to install

Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller (G:\iRST\32Bit\iaStorAC.inf)

☑ Hide drivers that aren't compatible with this computer's hardware.

Figure 1

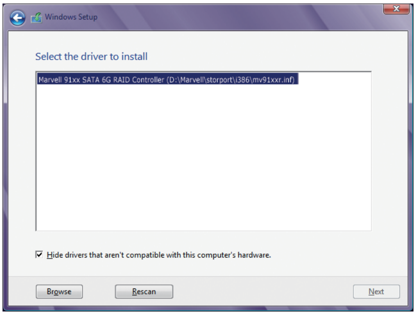
For the Marvell® 88SE9172:

Step 1:
Copy the **Marvell** folder under **BootDrv** in the driver disk to your USB thumb drive.

Step 2:
Boot from the Windows 8/7 setup disk and perform standard OS installation steps. When the screen requesting you to load the driver appears, select **Browse**.

Step 3:
Insert the USB thumb drive and then browse to the location of the driver. The locations of the drivers are as follows:
Windows 32-bit: \storport\i386
Windows 64-bit: \storport\amd64

Step 4:
When a screen as shown in Figure 2 appears, select **Marvell 91xx SATA 6G RAID Controller** and click **Next** to load the driver and continue the OS installation.



Marvell 91xx SATA 6G RAID Controller (D:\Marvell\storport\i386\mv91xxr.inf)

☑ Hide drivers that aren't compatible with this computer's hardware.

Figure 2

B. Rebuilding an Array

Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 5 or RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new drive must have equal or greater capacity than the old one.)

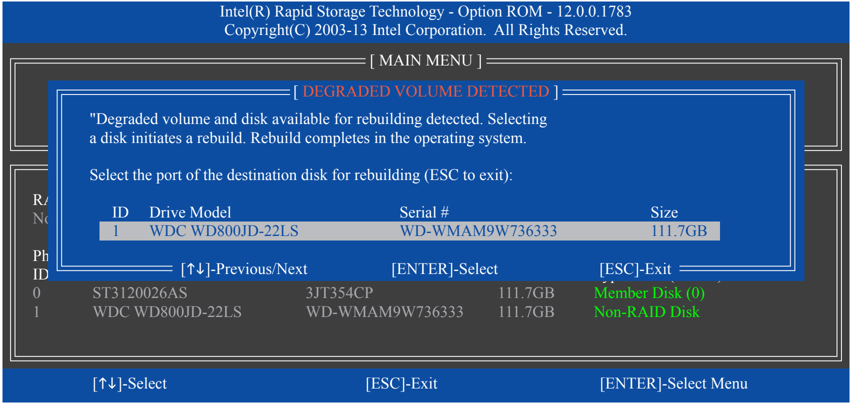
For the Intel® Z87:

Turn off your computer and replace the failed hard drive with a new one. Restart your computer.

- **Enabling Automatic Rebuild**

Step 1:

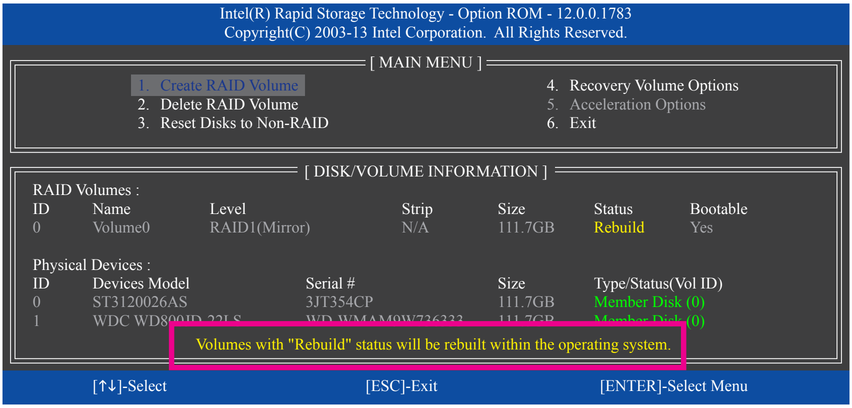
When the message "Press <Ctrl-I> to enter Configuration Utility" appears, press <Ctrl> + <I> to enter the RAID Configuration Utility. The following screen appears after you enter the RAID Configuration Utility.



```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

[ MAIN MENU ]

[ DEGRADED VOLUME DETECTED ]

"Degraded volume and disk available for rebuilding detected. Selecting
a disk initiates a rebuild. Rebuild completes in the operating system.

Select the port of the destination disk for rebuilding (ESC to exit):

ID   Drive Model              Serial #                    Size
1    WDC WD800JD-22LS         WD-WMAM9W736333             111.7GB

[↑↓]-Previous/Next            [ENTER]-Select              [ESC]-Exit

RA
No

Ph
ID
0    ST3120026AS        3JT354CP           111.7GB    Member Disk (0)
1    WDC WD800JD-22LS   WD-WMAM9W736333    111.7GB    Non-RAID Disk

[↑↓]-Select            [ESC]-Exit            [ENTER]-Select Menu
```

Step 2:

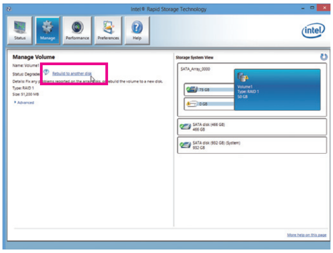
Select the new hard drive to add into the array to be rebuilt and press <Enter>. The following screen appears, indicating that an automatic rebuild will be performed after you enter the operating system. If you do not enable automatic rebuild on this stage, you have to manually rebuild the array in the operating system (see the next page for more details).



```
Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

[ MAIN MENU ]
    1.  Create RAID Volume                 4.  Recovery Volume Options
    2.  Delete RAID Volume                 5.  Acceleration Options
    3.  Reset Disks to Non-RAID            6.  Exit

[ DISK/VOLUME INFORMATION ]
RAID Volumes :
ID   Name       Level          Strip   Size      Status    Bootable
0    Volume0    RAID1(Mirror)  N/A     111.7GB   Rebuild   Yes

Physical Devices :
ID   Devices Model      Serial #           Size      Type/Status(Vol ID)
0    ST3120026AS        3JT354CP           111.7GB   Member Disk (0)
1    WDC WD800JD-22LS   WD-WMAM9W736333    111.7GB   Member Disk (0)

   Volumes with "Rebuild" status will be rebuilt within the operating system.

[↑↓]-Select            [ESC]-Exit            [ENTER]-Select Menu
```

- **Performing the Rebuild in the Operating System**

While in the operating system, make sure the chipset driver has been installed from the motherboard driver disk. Then launch the Intel® Rapid Storage Technology utility from the desktop.


Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Rebuild to another disk
Advanced
Storage System View
SATA_Array_0000
75 GB
0 GB
Volume1
Type: RAID 1
50 GB
SATA disk (466 GB)
466 GB
SATA disk (932 GB) (System)
932 GB
More help on this page

Manage Volume

Name: Volume1

Status: Degraded

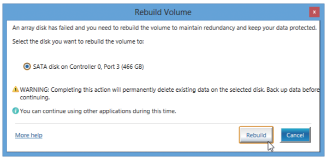
Details: Fix any problems reported on the array disks, or rebuild the volume to a new disk.

Type: RAID 1

Size: 51,200 MB

Step 1:

Go to the **Manage** menu and click **Rebuild to another disk** in **Manage Volume**.


Rebuild Volume
More help
Rebuild
Cancel

An array disk has failed and you need to rebuild the volume to maintain redundancy and keep your data protected.

Select the disk you want to rebuild the volume to:

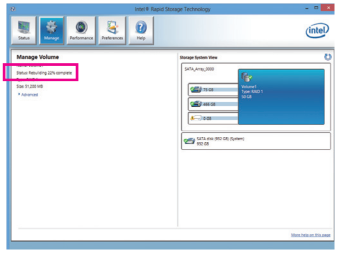
● SATA disk on Controller 0, Port 3 (466 GB)

WARNING: Completing this action will permanently delete existing data on the selected disk. Back up data before continuing.

You can continue using other applications during this time.

Step 2:

Select a new drive to rebuild the RAID and click **Rebuild**.

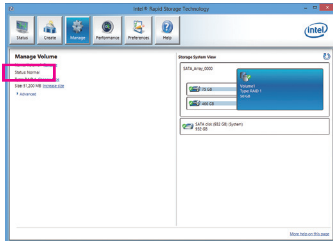

Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Advanced
Storage System View
SATA_Array_0000
75 GB
466 GB
0 GB
Volume1
Type: RAID 1
50 GB
SATA disk (932 GB) (System)
932 GB
More help on this page

Manage Volume

Status: Rebuilding 22% complete

Size: 51,200 MB

The **Status** item on the left of the screen displays the rebuild progress.


Intel® Rapid Storage Technology
Status
Create
Manage
Performance
Preferences
Help
intel
Increase size
Advanced
Storage System View
SATA_Array_0000
75 GB
466 GB
Volume1
Type: RAID 1
50 GB
SATA disk (932 GB) (System)
932 GB
More help on this page

Manage Volume

Status: Normal

Size: 51,200 MB

Step 3:

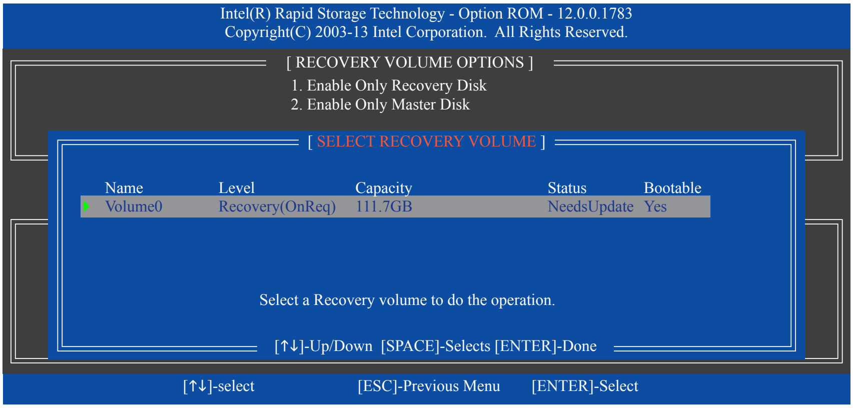
After the RAID 1 volume rebuilding, the **Status** will display as **Normal**.

- **Restoring the Master Drive to a Previous State (for Recovery Volume only)**

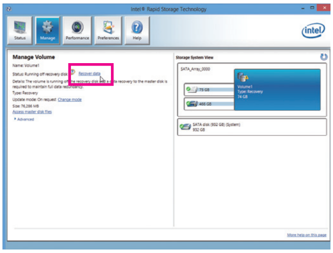
When two hard drives are set to Recovery Volume in Update on Request mode, you can restore the master drive data to the last backup state when needed. For example, in case the master drive detects a virus, you can restore the recovery drive data to the master drive.

Step 1:

Select **4. Recovery Volume Options** in the **MAIN MENU** of the Intel® RAID Configuration Utility. On the **RECOVERY VOLUMES OPTIONS** menu, select **Enable Only Recovery Disk** to show the recovery drive in the operating system. Follow the on-screen instructions to complete and exit the RAID Configuration Utility.



```
            Intel(R) Rapid Storage Technology - Option ROM - 12.0.0.1783
            Copyright(C) 2003-13 Intel Corporation.  All Rights Reserved.

                    [ RECOVERY VOLUME OPTIONS ]
                     1. Enable Only Recovery Disk
                     2. Enable Only Master Disk

                    [ SELECT RECOVERY VOLUME ]

     Name        Level              Capacity            Status        Bootable
     Volume0     Recovery(OnReq)    111.7GB             NeedsUpdate   Yes

                Select a Recovery volume to do the operation.

             [↑↓]-Up/Down  [SPACE]-Selects [ENTER]-Done

      [↑↓]-select              [ESC]-Previous Menu       [ENTER]-Select
```



Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Recover data
Change mode
Access master disk files
Advanced
Storage System View
SATA_Array_0000
75 GB
466 GB
More help on this page

Manage Volume

Name: Volume1

Status: Running off recovery disk

Details: The volume is running off the recovery disk and a data recovery to the master disk is required to maintain full data redundancy.

Type: Recovery

Update mode: On request

Size: 76,286 MB

Volume1

Type: Recovery

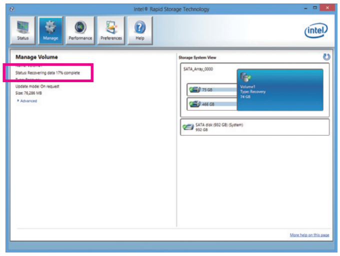
74 GB

SATA disk (932 GB) (System)

932 GB

Step 2:

Go to the **Manage** menu of the Intel® Rapid Storage Technology utility and click **Recover data** in **Manage Volume**.



Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Advanced
Storage System View
SATA_Array_0000
75 GB
466 GB
More help on this page

Manage Volume

Status: Recovering data 17% complete

Update mode: On request

Size: 76,286 MB

Volume1

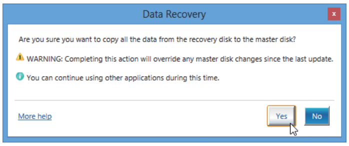
Type: Recovery

74 GB

SATA disk (932 GB) (System)

932 GB

The **Status** item on the left of the screen displays the rebuild progress.



Data Recovery
More help
Yes
No

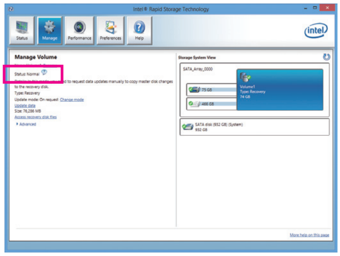
Are you sure you want to copy all the data from the recovery disk to the master disk?

⚠ WARNING: Completing this action will override any master disk changes since the last update.

You can continue using other applications during this time.

Step 3:

Click **Yes** to begin the data recovery.



Intel® Rapid Storage Technology
Status
Manage
Performance
Preferences
Help
intel
Change mode
Update data
Access recovery disk files
Advanced
Storage System View
SATA_Array_0000
More help on this page

Manage Volume

Status: Normal

Details: In this mode you need to request data updates manually to copy master disk changes to the recovery disk.

Type: Recovery

Update mode: On request

Size: 76,286 MB

Step 4:

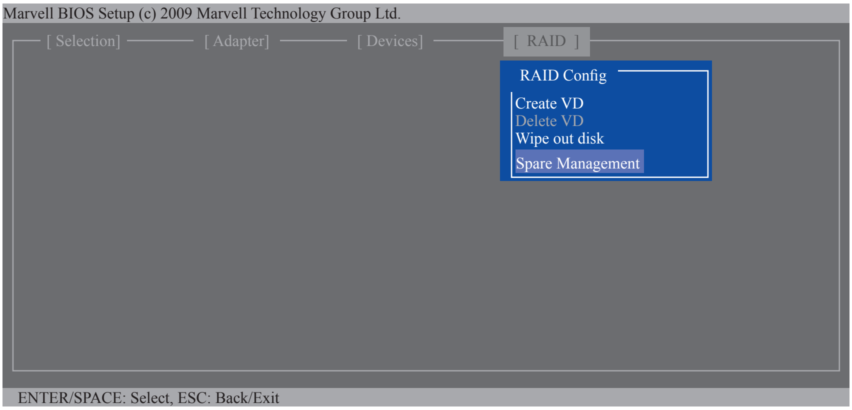
After the recovery volume is completed, the **Status** will display as **Normal**.

For the Marvell® 88SE9172:

Turn off your computer and replace the failed hard drive with a new one. Restart your computer. To enable an automatic rebuild in the operating system, you have to set the new hard drive as a Spare drive in the RAID setup utility first.

- **Enabling Automatic Rebuild**

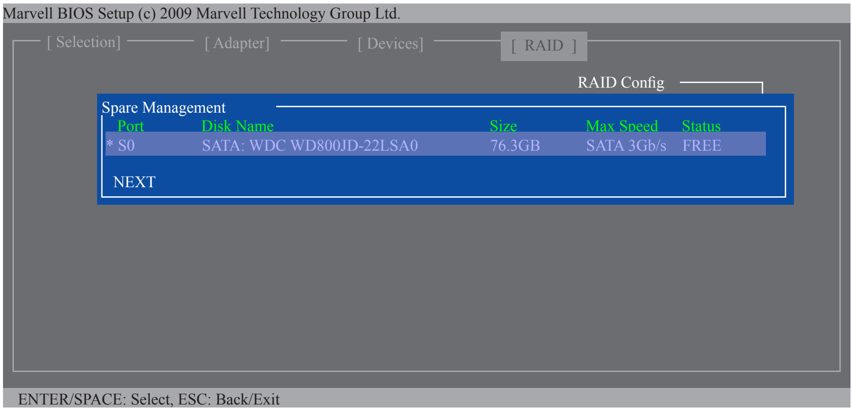
Step 1:
When the message "Press <Ctrl>+<M> to enter BIOS Setup or <Space> to continue" appears, press <Ctrl> + <M> to enter the RAID setup utility. On the main screen, press <Enter> on the **RAID** tab and then press <Enter> on **Spare Management**.


Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.

[Selection]
[Adapter]
[Devices]
[RAID]
RAID Config
Create VD
Delete VD
Wipe out disk
Spare Management

ENTER/SPACE: Select, ESC: Back/Exit

Step 2:
The new hard drive will be displayed on the screen. Press <Enter> or <Space> on the new hard drive to select it and then press <Enter> on **NEXT**. When prompted, press <Y> to confirm. The new hard drive is now set as a Spare drive.


Marvell BIOS Setup (c) 2009 Marvell Technology Group Ltd.

[Selection]
[Adapter]
[Devices]
[RAID]
RAID Config
Spare Management

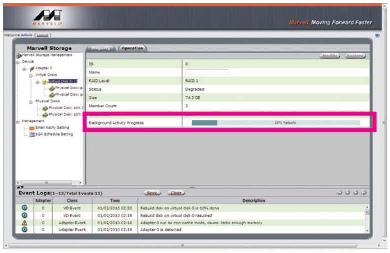
Port	Disk Name	Size	Max Speed	Status
* S0	SATA: WDC WD800JD-22LSA0	76.3GB	SATA 3Gb/s	FREE

NEXT

ENTER/SPACE: Select, ESC: Back/Exit

Step 3:
Make sure you have installed the Marvell® RAID driver and Marvell® Storage Utility from the motherboard driver disk. While in the operating system, launch the Marvell® Storage Utility from Start\All Programs\Marvell Storage Utility\Marvell Tray, right-click on the icon in the notification area, and select **Open MSU**. Then login the Marvell Storage Utility.

Under **Virtual Disk 0**, the **Property** tab displays the rebuild progress on the right of the **Background Activity Progress** item, indicating that the RAID volume is being rebuilt. When completed, the status will display as **Done**.


Marvell. Moving Forward Faster
Welcome Admin [Logout]
Marvell Storage
Property
Operation
Modify
Restore
Marvell Storage Management
Device
Adapter 0
Virtual Disks
Virtual Disk 0: [
Physical Disk: p
Physical Disk: p
Physical Disks
Physical Disk: port 0
Physical Disk: port 1
Management
Email Notify Setting
BGA Schedule Setting
Save
Clear

ID	0
Name	
RAID Level	RAID 1
Status	Degraded
Size	74.5 GB
Member Count	2
Background Activity Progress	15% Rebuild

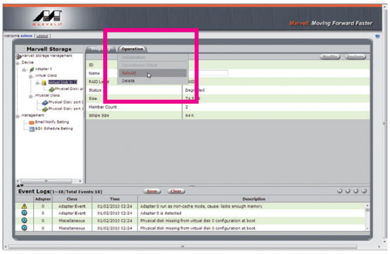
Event Logs(1~13/Total Events:13)

	Adapter	Class	Time	Description
ℹ	0	VD Event	01/02/2010 02:20	Rebuild disk on virtual disk 0 is 10% done
ℹ	0	VD Event	01/02/2010 02:18	Rebuild disk on virtual disk 0 resumed
⚠	0	Adapter Event	01/02/2010 02:18	Adapter 0 run as non-cache mode, cause: lacks enough memory
ℹ	0	Adapter Event	01/02/2010 02:18	Adapter 0 is detected

- **Manually Rebuilding RAID 1 in the Operating System**

You can manually rebuild a RAID 1 array without setting the new hard drive as a Spare drive in the RAID setup utility first. While in the operating system, open the Marvell® Storage Utility and login.

Step 1:
Under **Virtual Disk 0**, click the **Operation** tab and select **Rebuild**.

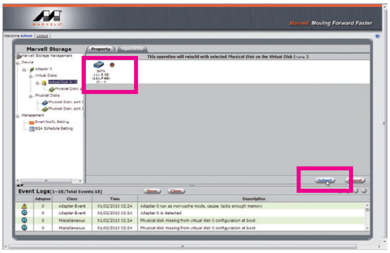

Marvell. Moving Forward Faster
Welcome Admin [Logout]
Marvell Storage
Property
Operation
Initialization
Consistency Check
Rebuild
Delete
Modify
Restore
Marvell Storage Management
Device
Adapter 0
Virtual Disks
Virtual Disk 0: [
Physical Disk: p
Physical Disks
Physical Disk: port 0
Physical Disk: port 1
Management
Email Notify Setting
BGA Schedule Setting
Save
Clear

ID	
Name	
RAID Le	AID
Status	Deg ded
Size	74.5
Member Count	2
Stripe size	64 K

Event Logs(1~18/Total Events:18)

	Adapter	Class	Time	Description
⚠	0	Adapter Event	01/02/2010 02:24	Adapter 0 run as non-cache mode, cause: lacks enough memory
ℹ	0	Adapter Event	01/02/2010 02:24	Adapter 0 is detected
ℹ	0	Miscellaneous	01/02/2010 02:24	Physical disk missing from virtual disk 0 configuration at boot
ℹ	0	Miscellaneous	01/02/2010 02:24	Physical disk missing from virtual disk 0 configuration at boot

Step 2:
The screen will display the new hard drive. Click on the hard drive to select it and click the **Submit** button to begin the rebuild.


Marvell. Moving Forward Faster
Welcome Admin [Logout]
Marvell Storage
Property
Operation
Marvell Storage Management
Device
Adapter 0
Virtual Disks
Virtual Disk 0: [
Physical Disk: p
Physical Disks
Physical Disk: port 0
Physical Disk: port 1
Management
Email Notify Setting
BGA Schedule Setting
SATA
111.8 GB
(111.7 GB)
ID : 0
Submit
ncel
Save
Clear

This operation will rebuild with selected Physical Disk on the Virtual Disk (Name:)

Event Logs(1~18/Total Events:18)

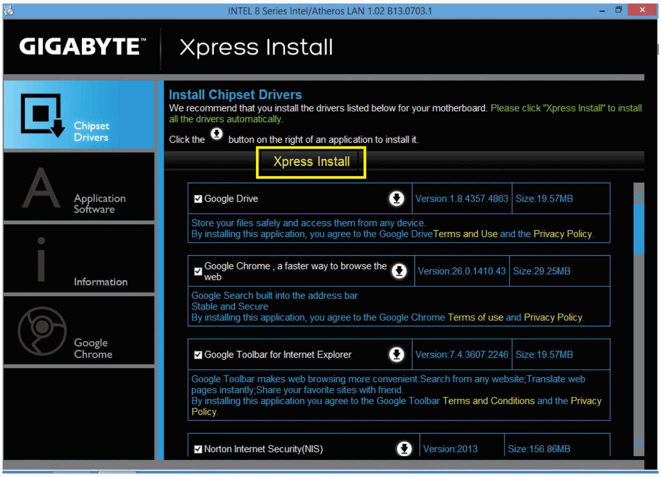
	Adapter	Class	Time	Description
⚠	0	Adapter Event	01/02/2010 02:24	Adapter 0 run as non-cache mode, cause: lacks enough memory
ℹ	0	Adapter Event	01/02/2010 02:24	Adapter 0 is detected
ℹ	0	Miscellaneous	01/02/2010 02:24	Physical disk missing from virtual disk 0 configuration at boot
ℹ	0	Miscellaneous	01/02/2010 02:24	Physical disk missing from virtual disk 0 configuration at boot

Chapter 4 Drivers Installation

- Before installing the drivers, first install the operating system. (The following instructions use Windows 8 as the example operating system.)
- After installing the operating system, insert the motherboard driver disk into your optical drive. Click on the message "Tap to choose what happens with this disc" on the top-right corner of the screen and select "Run **Run**.exe." (Or go to My Computer, double-click the optical drive and execute the **Run**.exe program.)

4-1 Chipset Drivers

"Xpress Install" will automatically scan your system and then list all of the drivers that are recommended to install. You can click the **Xpress Install** button and "Xpress Install" will install all of the selected drivers. Or click the arrow ⬇ icon to individually install the drivers you need.



Install Chipset Drivers

We recommend that you install the drivers listed below for your motherboard. Please click "Xpress Install" to install all the drivers automatically.

Click the ⬇ button on the right of an application to install it.

☑ Google Drive ⬇ Version:1.8.4357.4863 Size:19.57MB
Store your files safely and access them from any device.
By installing this application, you agree to the Google DriveTerms and Use and the Privacy Policy.

☑ Google Chrome , a faster way to browse the web ⬇ Version:26.0.1410.43 Size:29.25MB
Google Search built into the address bar
Stable and Secure
By installing this application, you agree to the Google Chrome Terms of use and Privacy Policy.

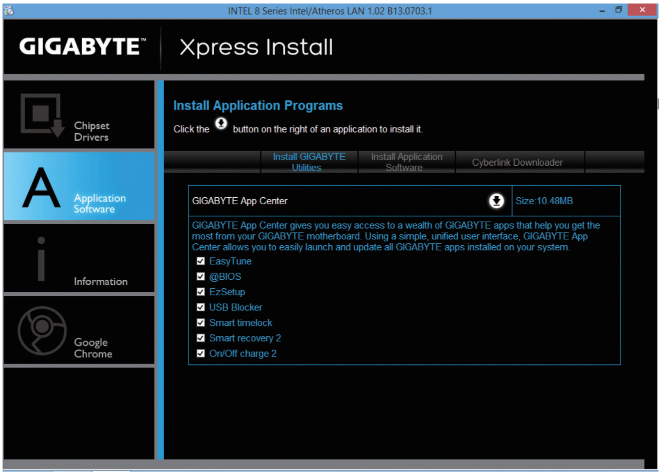
☑ Google Toolbar for Internet Explorer ⬇ Version:7.4.3607.2246 Size:19.57MB
Google Toolbar makes web browsing more convenient:Search from any website;Translate web pages instantly;Share your favorite sites with friend.
By installing this application you agree to the Google Toolbar Terms and Conditions and the Privacy Policy.

☑ Norton Internet Security(NIS) ⬇ Version:2013 Size:156.86MB

- Please ignore the popup dialog box(es) (e.g. the **Found New Hardware Wizard**) displayed when "Xpress Install" is installing the drivers. Failure to do so may affect the driver installation.
- Some device drivers will restart your system automatically during the driver installation. After the system restart, "Xpress Install" will continue to install other drivers.

4-2 Application Software

This page displays the apps that GIGABYTE develops and some free software. You can select the apps you want and click the **Install** icon to begin the installation.


INTEL 8 Series Intel/Atheros LAN 1.02 B13.0703.1
GIGABYTE™
Xpress Install
Chipset Drivers
Application Software
Information
Google Chrome
Install GIGABYTE Utilities
Install Application Software
Cyberlink Downloader

Install Application Programs

Click the button on the right of an application to install it.

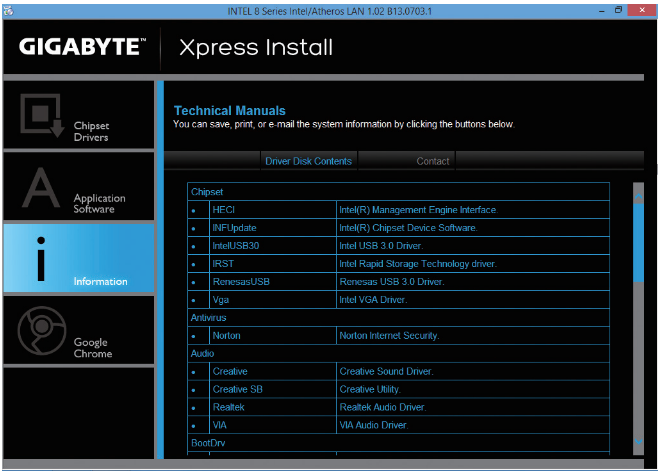
GIGABYTE App Center Size:10.48MB

GIGABYTE App Center gives you easy access to a wealth of GIGABYTE apps that help you get the most from your GIGABYTE motherboard. Using a simple, unified user interface, GIGABYTE App Center allows you to easily launch and update all GIGABYTE apps installed on your system.

- ☑ EasyTune
- ☑ @BIOS
- ☑ EzSetup
- ☑ USB Blocker
- ☑ Smart timelock
- ☑ Smart recovery 2
- ☑ On/Off charge 2

4-3 Information

This page provides detailed information on the drivers on the driver disk. The **Contact** page provides contact information of the GIGABYTE Taiwan headquarter. You can click the URL on this page to link to the GIGABYTE website to check more information on the GIGABYTE headquarter or worldwide branch offices.


INTEL 8 Series Intel/Atheros LAN 1.02 B13.0703.1
GIGABYTE™
Xpress Install
Chipset Drivers
Application Software
Information
Google Chrome
Driver Disk Contents
Contact

Technical Manuals

You can save, print, or e-mail the system information by clicking the buttons below.

Chipset		
•	HECI	Intel(R) Management Engine Interface.
•	INFUpdate	Intel(R) Chipset Device Software.
•	IntelUSB30	Intel USB 3.0 Driver.
•	IRST	Intel Rapid Storage Technology driver.
•	RenesasUSB	Renesas USB 3.0 Driver.
•	Vga	Intel VGA Driver.
Antivirus		
•	Norton	Norton Internet Security.
Audio		
•	Creative	Creative Sound Driver.
•	Creative SB	Creative Utility.
•	Realtek	Realtek Audio Driver.
•	VIA	VIA Audio Driver.
BootDrv		

Chapter 5 Unique Features

5-1 BIOS Update Utilities

GIGABYTE motherboards provide two unique BIOS update tools, Q-Flash™ and @BIOS™. GIGABYTE Q-Flash and @BIOS are easy-to-use and allow you to update the BIOS without the need to enter MS-DOS mode. Additionally, this motherboard features the DualBIOS™ design, which enhances protection for the safety and stability of your computer by adding one more physical BIOS chip.

What is DualBIOS™?

Motherboards that support DualBIOS have two BIOS onboard, a main BIOS and a backup BIOS. Normally, the system works on the main BIOS. However, if the main BIOS is corrupted or damaged, the backup BIOS will take over on the next system boot and copy the BIOS file to the main BIOS to ensure normal system operation. For the sake of system safety, users cannot update the backup BIOS manually.

What is Q-Flash™?

With Q-Flash you can update the system BIOS without having to enter operating systems like MS-DOS or Window first. Embedded in the BIOS, the Q-Flash tool frees you from the hassles of going through complicated BIOS flashing process.

What is @BIOS™?

@BIOS allows you to update the system BIOS while in the Windows environment. @BIOS will download the latest BIOS file from the nearest @BIOS server site and update the BIOS.

5-1-1 Updating the BIOS with the Q-Flash Utility

A. Before You Begin

1. From GIGABYTE's website, download the latest compressed BIOS update file that matches your motherboard model.
2. Extract the file and save the new BIOS file (e.g. Z87XUD5TH.F1) to your USB flash drive or hard drive. Note: The USB flash drive or hard drive must use FAT32/16/12 file system.
3. Restart the system. During the POST, press the <End> key to enter Q-Flash. Note: You can access Q-Flash by either pressing the <End> key during the POST or pressing the <F8> key in BIOS Setup. However, if the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent SATA controller, use the <End> key during the POST to access Q-Flash.

Because BIOS flashing is potentially risky, please do it with caution. Inadequate BIOS flashing may result in system malfunction.

B. Updating the BIOS

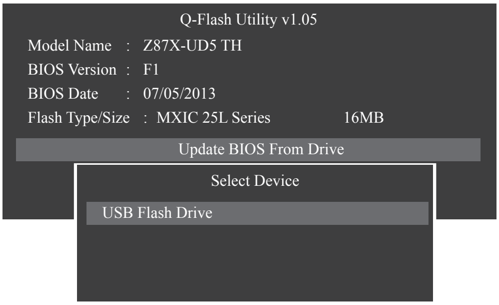
In the main menu of Q-Flash, use the keyboard or mouse to select an item to execute. When updating the BIOS, choose the location where the BIOS file is saved. The following procedure assumes that you save the BIOS file to a USB flash drive.

Step 1:

1. Insert the USB flash drive containing the BIOS file into the computer. In the main menu of Q-Flash, select **Update BIOS From Drive**.

   - The **Save BIOS to Drive** option allows you to save the current BIOS file.
   - Q-Flash only supports USB flash drive or hard drives using FAT32/16/12 file system.
   - If the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent SATA controller, use the <End> key during the POST to access Q-Flash.

2. Select **USB Flash Drive**.



```
Q-Flash Utility v1.05
Model Name    :  Z87X-UD5 TH
BIOS Version  :  F1
BIOS Date     :  07/05/2013
Flash Type/Size  :  MXIC 25L Series          16MB
Update BIOS From Drive
Select Device
USB Flash Drive
```

3. Select the BIOS update file.

   Make sure the BIOS update file matches your motherboard model.

Step 2:

The process of the system reading the BIOS file from the USB flash drive is displayed on the screen. When the message "Are you sure to update BIOS?" appears, select **Yes** to begin the BIOS update. The monitor will display the update process.

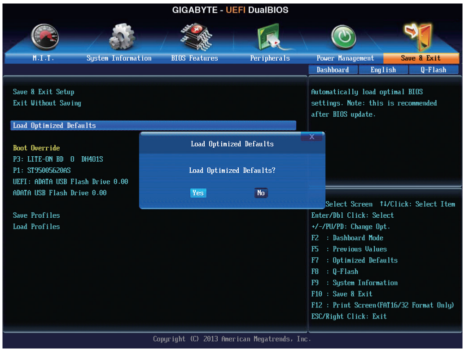
- **Do not turn off or restart the system when the system is reading/updating the BIOS.**
- **Do not remove the USB flash drive or hard drive when the system is updating the BIOS.**

Step 3:

The system will restart after the update process is complete.

Step 4:

During the POST, press <Delete> to enter BIOS Setup. Select **Load Optimized Defaults** on the **Save & Exit** screen and press <Enter> to load BIOS defaults. System will re-detect all peripheral devices after a BIOS update, so we recommend that you reload BIOS defaults.


GIGABYTE - UEFI DualBIOS
M.I.T.
System Information
BIOS Features
Peripherals
Power Management
Save & Exit
Dashboard
English
Q-Flash
Save & Exit Setup
Exit Without Saving
Load Optimized Defaults
Boot Override
P3: LITE-ON BD 0 DH401S
P1: ST95005620AS
UEFI: ADATA USB Flash Drive 0.00
ADATA USB Flash Drive 0.00
Save Profiles
Load Profiles
Load Optimized Defaults
X
Yes
No
Copyright (C) 2013 American Megatrends, Inc.

Automatically load optimal BIOS settings. Note: this is recommended after BIOS update.

Load Optimized Defaults?

Select Screen ↑↓/Click: Select Item
Enter/Dbl Click: Select
+/-/PU/PD: Change Opt.
F2 : Dashboard Mode
F5 : Previous Values
F7 : Optimized Defaults
F8 : Q-Flash
F9 : System Information
F10 : Save & Exit
F12 : Print Screen(FAT16/32 Format Only)
ESC/Right Click: Exit

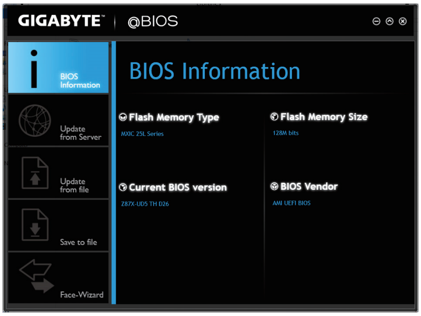
Select **Yes** to load BIOS defaults

Step 5:

Select **Save & Exit Setup** and press <Enter>. And then select **Yes** to save settings to CMOS and exit BIOS Setup. The procedure is complete after the system restarts.

5-1-2 Updating the BIOS with the @BIOS Utility

A. Before You Begin



Flash Memory Type: MXIC 25L Series
Flash Memory Size: 128M bits
Current BIOS version: Z87X-UD5 TH D26
BIOS Vendor: AMI UEFI BIOS

1. In Windows, close all applications and TSR (Terminate and Stay Resident) programs. This helps prevent unexpected failures when performing a BIOS update.
2. If the BIOS is being updated via the Internet, ensure the Internet connection is stable and do NOT interrupt the Internet connection (for example, avoid a power loss or switching off the Internet). Failure to do so may result in a corrupted BIOS or a system that is unable to start.
3. GIGABYTE product warranty does not cover any BIOS damage or system failure resulting from an inadequate BIOS flashing.

B. Using @BIOS

1. Update the BIOS Using the Internet Update Function:

Click **Update from Server**, select the @BIOS server site closest to your location and then download the BIOS file that matches your motherboard model. Follow the on-screen instructions to complete.

If the BIOS update file for your motherboard is not present on the @BIOS server site, please manually download the BIOS update file from GIGABYTE's website and follow the instructions in "Update the BIOS without Using the Internet Update Function" below.

2. Update the BIOS without Using the Internet Update Function:

Click **Update from file**, then select the location where you save the BIOS update file obtained from the Internet or through other source. Follow the on-screen instructions to complete.

3. Save the Current BIOS File:

Click **Save to file** to save the current BIOS file.

4. Change the Boot-up Logo:

Click **Upload new image** in Face-Wizard and you will be able to change the boot-up logo with your own picture, creating a personalized boot-up screen. Click **Backup current image** to save the currently used boot-up logo.

Supported image formats include jpg, bmp, and gif.

C. After Updating the BIOS

Restart your system after updating the BIOS.

- Make sure that the BIOS file to be flashed matches your motherboard model. Updating the BIOS with an incorrect BIOS file could cause your system not to boot.
- Do not turn off the system or remove the power during the BIOS update process, or the BIOS may corrupt and the system may not boot.

5-2 APP Center

GIGABYTE App Center gives you easy access to a wealth of GIGABYTE apps that help you get the most from your GIGABYTE motherboard (Note). Using a simple, unified user interface, GIGABYTE App Center allows you to easily launch all GIGABYTE apps installed on your system, check related udpates online, and download the apps, drivers, and BIOS.

Running the APP Center

Insert the motherboard driver disk. On the Autorun screen, go to **Application Software\Install GIGABYTE Utilities** to install GIGABYTE App Center and the selected apps. Restart your computer after the installation is complete. In Desktop mode, click the App Center icon in the notification area to launch the App Center utility (Figure 1). On the main menu, you can select an app to run or click **Live Update** to update an app online.

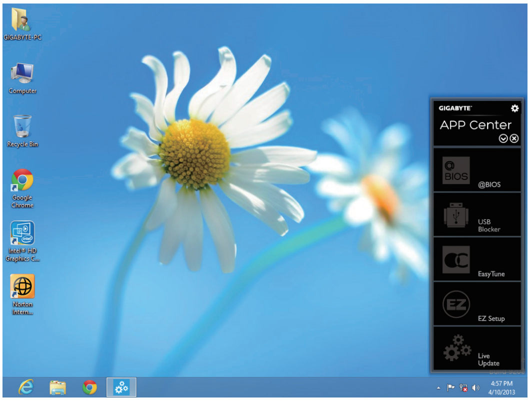

GIGABYTE-PC
Computer
Recycle Bin
Google Chrome
Intel® HD Graphics C...
Norton Interne...
GIGABYTE
APP Center
@BIOS
USB Blocker
EasyTune
EZ Setup
Live Update
4:57 PM
4/10/2013

Figure 1

If the App Center is closed, you can restart it by clicking the App Center icon on the Start menu. (Figure 2)

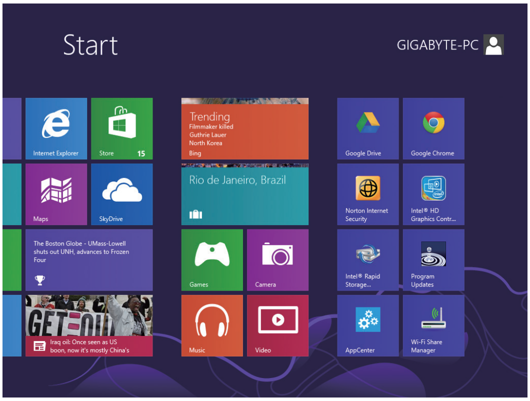

Start
GIGABYTE-PC
Internet Explorer
Store 15
Trending
Filmmaker killed
Guthrie Lauer
North Korea
Bing
Google Drive
Google Chrome
Maps
SkyDrive
Rio de Janeiro, Brazil
Norton Internet Security
Intel® HD Graphics Contr...
The Boston Globe - UMass-Lowell shuts out UNH, advances to Frozen Four
Games
Camera
Intel® Rapid Storage...
Program Updates
Iraq oil: Once seen as US boon, now it's mostly China's
Music
Video
AppCenter
Wi-Fi Share Manager

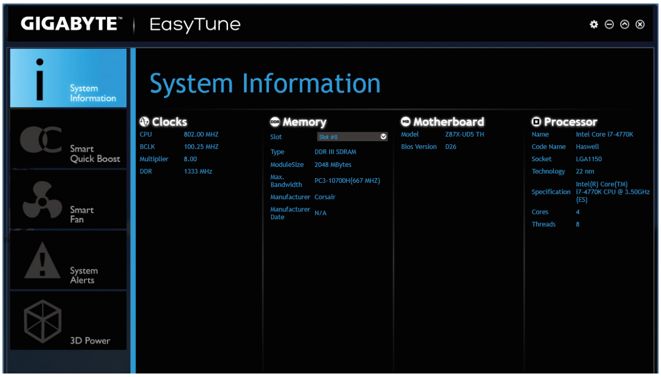
Figure 2

(Note) Available applications in APP Center may differ by motherboard model. Supported functions of each application may also differ depending on motherboard specifications.

5-2-1 EasyTune

GIGABYTE's EasyTune is a simple and easy-to-use interface that allows users to fine-tune their system settings or do overclock/overvoltage in Windows environment. The user-friendly EasyTune interface also includes tabbed pages for CPU and memory information, letting users read their system-related information without the need to install additional software.

The EasyTune Interface



System Information

Clocks
CPU 802.00 MHZ
BCLK 100.25 MHZ
Multiplier 8.00
DDR 1333 MHz

Memory
Slot: Slot #0
Type: DDR III SDRAM
ModuleSize: 2048 MBytes
Max. Bandwidth: PC3-10700H(667 MHZ)
Manufacturer: Corsair
Manufacturer Date: N/A

Motherboard
Model: Z87X-UD5 TH
Bios Version: D26

Processor
Name: Intel Core i7-4770K
Code Name: Haswell
Socket: LGA1150
Technology: 22 nm
Specification: Intel(R) Core(TM) i7-4770K CPU @ 3.50GHz (ES)
Cores: 4
Threads: 8

Tabs Information

Tab	Function
System Information	The **System Information** tab provides information on the installed CPU and motherboard.
Smart Quick Boost	**Smart Quick Boost** provides you with different levels of CPU frequency to choose to achieve desired system performance. After making changes, be sure to restart your system for these changes to take effect. The Advanced menu allows you to change specific clock/frequency/votlage settings.
Smart Fan	The **Smart Fan** tab allows you to specify a Smart Fan mode. The Calibrate menu displays the detected linear fan speed for the fans on the motherboard from the fastest to the slowest. The Advanced menu allows you to set temperature thresholds, based on which the fan speed can be changed linearly.
System Alerts	The **System Alerts** tab allows you to monitor hardware temperature, voltage and fan speed and set temperature/fan speed alarm.
3D Power	The **3D Power** tab allows you to change power phase and voltage settings.

Available functions in EasyTune may differ by motherboard model. Grayed-out area(s) indicates that the item is not configurable or the function is not supported.

Incorrectly doing overclock/overvoltage may result in damage to the hardware components such as CPU, chipset, and memory and reduce the useful life of these components. Before you do the overclock/overvoltage, make sure that you fully know each function of EasyTune, or system instability or other unexpected results may occur.

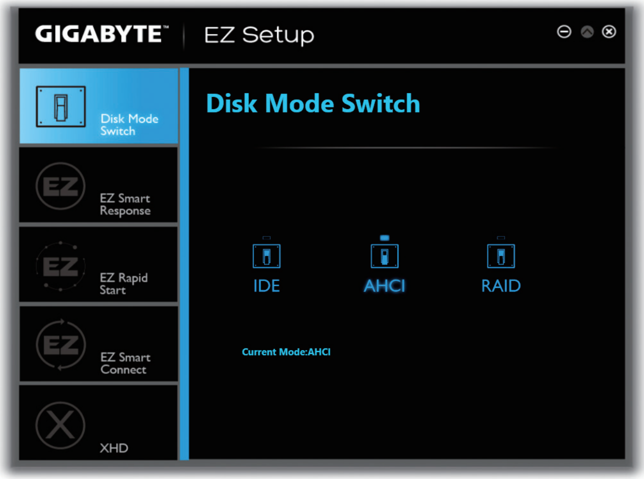
5-2-2 EZ Setup

The GIGABYTE EZ Setup utility includes the following 'EZ' setups applications that will offer greatly simplified install and configuration procedures: Disk Mode Switch, EZ Smart Response, EZ Rapid Start, EZ Smart Connect, and XHD.

Disk Mode Switch

Disk Mode Switch allows you to switch the operating mode for your hard drive even after it's been installed with an operating system. Supported operating modes include IDE, AHCI, and RAID. You can select a disk mode and restart your computer after the selection.

- Native UEFI mode is not supported.
- Be sure to reinstall the Intel® Rapid Storage Technology utility after you switch the disk mode.


GIGABYTE™
EZ Setup
Disk Mode Switch
EZ Smart Response
EZ Rapid Start
EZ Smart Connect
XHD
Disk Mode Switch
IDE
AHCI
RAID

Current Mode:AHCI

EZ Smart Response

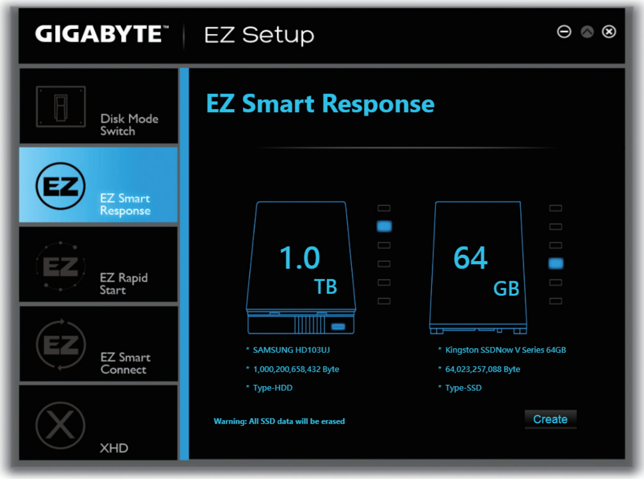
A. System Requirements

1. An Intel® Chipset-based motherboard supporting this feature (Note 1)
2. Intel® Core series processor
3. Intel® SATA controller set to RAID mode
4. Intel® Rapid Storage Technology utility installed (Note 1)
5. A conventional SATA disk and an SSD (Note 2)
6. Windows 7 with SP1/Windows 8 (Note 3)

If you have installed the operating system before configuring the Smart Response Technology, all original data on the SSD will be lost once you enable RAID mode (Note 4). It is recommended that you back up the hard disk before enabling the Smart Response Technology.

B. Using EZ Smart Response

Select **EZ Smart Response** and click **Create**.
To disable this function, click **Delete**.



* SAMSUNG HD103UJ
* 1,000,200,658,432 Byte
* Type-HDD

* Kingston SSDNow V Series 64GB
* 64,023,257,088 Byte
* Type-SSD

Warning: All SSD data will be erased

(Note 1) Before start, make sure you have installed the Intel® Rapid Storage Technology utility (version 11.5 or above).

(Note 2) The SSD works as a cache of the hard disk. The maximum cache memory size is 64 GB. If you use an SSD larger than 64 GB, the space beyond 64 GB can still be used for storing your data.

(Note 3) The operating system must be installed to the SATA disk.

(Note 4) Regardless of the BIOS settings, be it IDE or AHCI mode, the system will be forced into RAID mode.

EZ Rapid Start

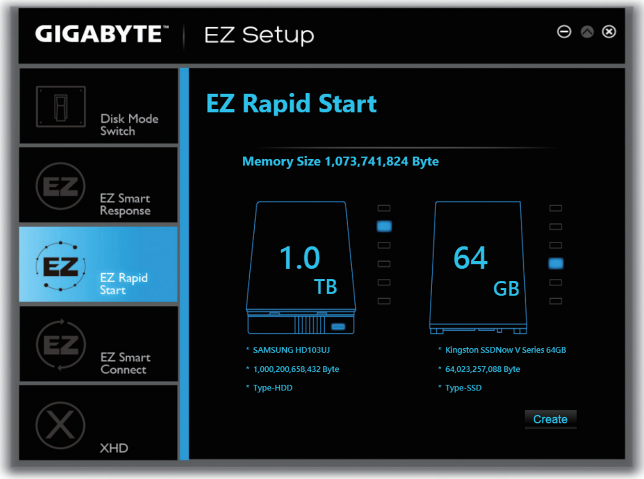
A. System Requirements

1. Intel® Rapid Start Technology enabled in BIOS Setup
2. An SSD with size larger than the total system memory
3. Windows 7 with SP1/Windows 8
4. AHCI/RAID mode supported (please note if the SSD has been assigned as a member of a RAID array, it cannot be used to set up and Intel® Rapid Start store partition); IDE mode not supported (Note)

B. Using EZ Rapid Start

Select **EZ Rapid Start** and click **Create**. Then install the Intel® Rapid Start Technology utility and restart your computer to complete.

To disable this function, click **Delete**.



EZ Rapid Start

Memory Size 1,073,741,824 Byte

* SAMSUNG HD103UJ
* 1,000,200,658,432 Byte
* Type-HDD

* Kingston SSDNow V Series 64GB
* 64,023,257,088 Byte
* Type-SSD

- The default compressed space is the system memory size plus 2 GB. For example, if the system memory size is 8 GB, the default compressed space is 8 GB plus 2 GB, so the SSD capacity will decrease by 10 GB. If EZ Rapid Start is disabled, the decreased 10 GB will be returned to the SSD.
- If you want to upgrade your system memory, disable EZ Rapid Start first and re-install it to ensure it can work normally.

(Note) If the motherboard Chipset supports RAID, EZ Rapid Start will force the Intel® SATA controllers into RAID mode. If not, the Intel® SATA controllers will be forced into AHCI mode.

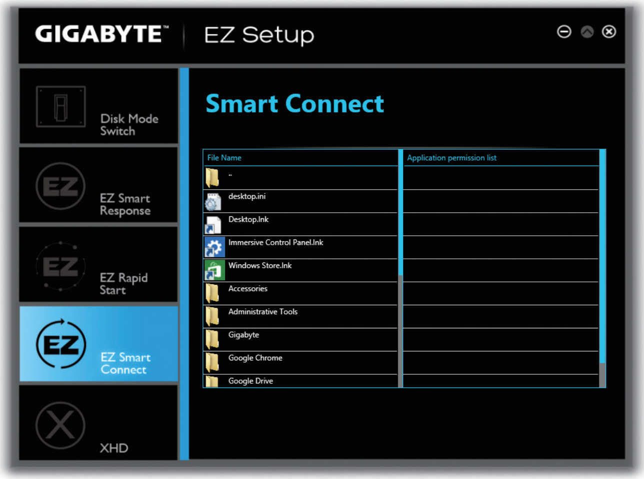
EZ Smart Connect

A. System Requirements

1. Intel® Smart Connect Technology enabled in BIOS Setup
2. Windows 7 with SP1/Windows 8
3. Intel® Smart Connect Technology utility installed
4. Properly-working network connection
5. Programs added to the White List must be turned on (Note)

B. Using EZ Smart Connect

Select **EZ Smart Connect**. Under **File Name**, select the apps to be auto-updated by Smart Connect. Double-click the app to add it to the **Application permission list**. (Double-click .. to return to the previous directory.)


GIGABYTE™
EZ Setup
Disk Mode Switch
EZ Smart Response
EZ Rapid Start
EZ Smart Connect
XHD
Smart Connect

File Name	Application permission list
..	
desktop.ini	
Desktop.lnk	
Immersive Control Panel.lnk	
Windows Store.lnk	
Accessories	
Administrative Tools	
Gigabyte	
Google Chrome	
Google Drive	

(Note) This feature works best with programs designed to work automatically with the Internet to obtain their data such as Outlook®, Windows Live™ Mail, and Seesmic®.

XHD

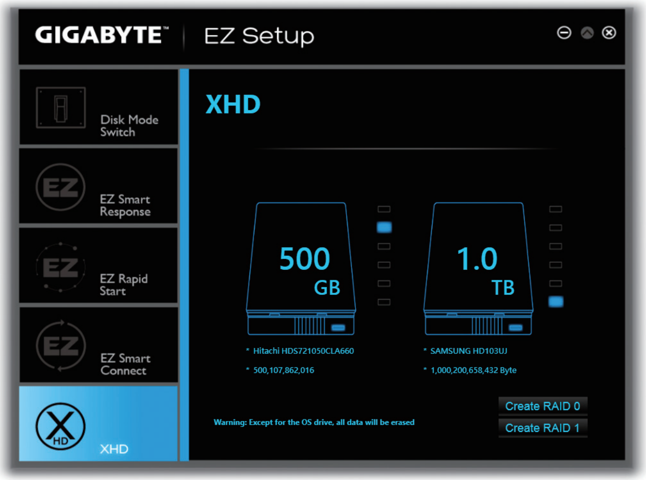
With GIGABYTE XHD (Note 1), users can quickly configure a RAID-ready system for RAID 0 or RAID 1 when a new SATA drive is added. All with a simple click of a button, XHD helps to enhance your hard drive read/write performance without the need for complex and time-consuming configurations. .

A. System Requirements

1. An Intel® Chipset motherboard supporting RAID
2. Intel® SATA controllers set to RAID mode
3. Intel® Rapid Storage Technology utility installed
4. Windows 7 with SP1/Windows 8
5. Intel® SATA controller driver installed

B. Using XHD

Select **XHD** and click **Create RAID 0** or **Create RAID 1** based on your need. (Note 2)


GIGABYTE
EZ Setup
Disk Mode Switch
EZ Smart Response
EZ Rapid Start
EZ Smart Connect
XHD
XHD
500 GB
1.0 TB
Create RAID 0
Create RAID 1

* Hitachi HDS721050CLA660
* 500,107,862,016

* SAMSUNG HD103UJ
* 1,000,200,658,432 Byte

Warning: Except for the OS drive, all data will be erased

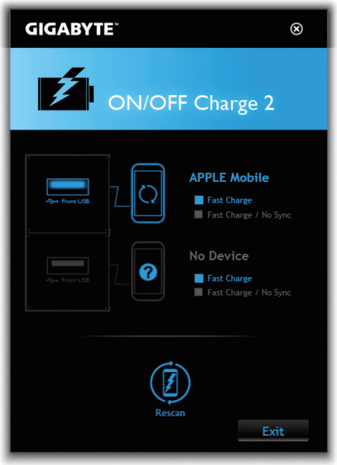
(Note 1) The XHD utility only supports the SATA connectors controlled by the Intel® Chipset.

(Note 2) Except for the operating system drive, all data on other hard drive will be deleted. Back up your data before using the XHD utility.

5-2-3 ON/OFF Charge2

GIGABYTE ON/OFF Charge2 Technology can automatically detect your mobile device such as smart phone and tablet PC and quickly charge the device through USB interface. It provides the best charging solution while the system is turned on, in sleep/standby mode, or even turned off.

The ON/OFF Charge2 Interface


GIGABYTE
ON/OFF Charge 2
Front USB
APPLE Mobile
Fast Charge
Fast Charge / No Sync
Front USB
No Device
Fast Charge
Fast Charge / No Sync
Rescan
Exit

Using ON/OFF Charge2

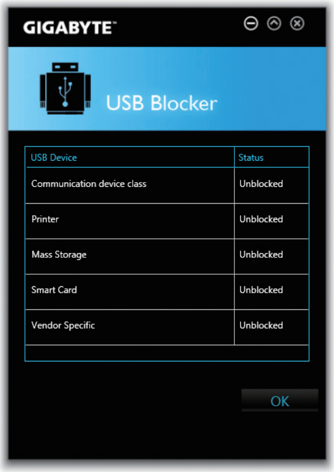
ON/OFF Charge2 automatically detects your mobile device and displays it on the screen. Available functions may vary by device. If your mobile device does not support data sync, select **Fast Charge/No Sync** to enable a quick charge.

- **Fast Charge:**
  Automatically detects mobile device(s) and enables both quick charge and data sync.
- **Fast Charge/No Sync:**
  Automatically detects mobile device(s) and enables a quick charge but no data sync.
- **Rescan:**
  Rescan the connected mobile device(s).
- **Exit:**
  Turn off ON/OFF Charge2.

5-2-4 USB Blocker

GIGABYTE USB Blocker provides you with an easy-to-use interface that allows you to block certain USB device types on your PC. Devices classes that are blocked will be ignored by the operating system.

The USB Blocker Interface



USB Device	Status
Communication device class	Unblocked
Printer	Unblocked
Mass Storage	Unblocked
Smart Card	Unblocked
Vendor Specific	Unblocked

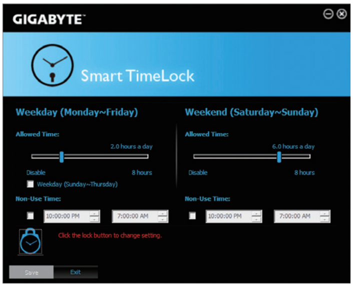
Using USB Blocker

Select the class of USB device that you would like to block or unblocked. Double left-click to change the **Blocked** or **Unblocked** status and click **OK**. Then enter your password and click **OK** to complete.

5-2-5 Smart TimeLock

GIGABYTE Smart TimeLock allows users to effectively manage computer usage time with simple rules and options.

The Smart TimeLock Interface



Weekday (Monday~Friday)

Allowed Time: 2.0 hours a day (Disable – 8 hours)

☐ Weekday (Sunday~Thursday)

Non-Use Time: ☐ 10:00:00 PM 7:00:00 AM

Weekend (Saturday~Sunday)

Allowed Time: 6.0 hours a day (Disable – 8 hours)

Non-Use Time: ☐ 10:00:00 PM 7:00:00 AM

Click the lock button to change setting.

Using Smart TimeLock

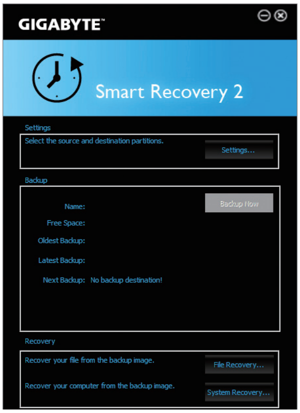
Click the lock icon on the bottom left corner and enter the password (Note). Set the time when a user can or cannot use your computerfor weekdays and weekends. Click **Save** to save the settings and click **Exit** to exit.

An alert will appear 15 minutes and 1 minute prior to the default shutdown time. When the alert appears, you can enter the password to extend the usage time or click **Cancel** to close the alert. If you respond **Cancel**, you will be requested to enter the password to extend the usage time again when the default shutdown time arrives, or the computer will shutdown right away.

(Note) You can set the User Password in the system BIOS Setup program to prevent the system time being changed by other users.

5-2-6 Smart Recovery 2

Smart Recovery 2 allows you to back up a partition as an image file every hour. You can use these images to restore your system or files when needed.


GIGABYTE
Smart Recovery 2
Settings
Settings...
Backup
Backup Now
Name:
Free Space:
Oldest Backup:
Latest Backup:
Recovery
File Recovery...
System Recovery...

Select the source and destination partitions.

Next Backup: No backup destination!

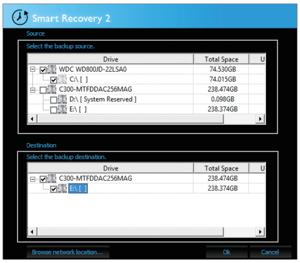
Recover your file from the backup image.

Recover your computer from the backup image.

The Smart Recovery 2 main menu:

Button	Function
Settings	Allows you to select the source and destination partition
Backup Now	Allows you to perform the backup immediately
File Recovery...	Allows you to recover your files from the backup image
System Recovery...	Allows you to recover your system from the backup image

- Smart Recovery 2 only supports NTFS file system.
- You need to select the destination partition in **Settings** the first time you use Smart Recovery 2.
- The **Backup Now** button will be available only after you log in Windows for ten minutes.


Smart Recovery 2
Source
Destination
Browse network location...
Ok
Cancel

Select the backup source.

Drive	Total Space	U
⊟ ☑ WDC WD800JD-22LSA0	74.530GB	
☑ C:\ [ ]	74.015GB	
⊟ ☐ C300-MTFDDAC256MAG	238.474GB	
☐ D:\ [System Reserved]	0.098GB	
☐ E:\ [ ]	238.374GB	

Select the backup destination.

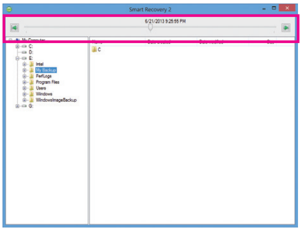
Drive	Total Space	U
⊟ ☑ C300-MTFDDAC256MAG	238.474GB	
☑ E:\ [ ]	238.374GB	

Creating a backup:

Click the **Settings** button on the main menu. In the **Settings** dialog box, select the source partition and destination partition and click **OK**. The initial backup will start after 10 minutes and regular backup will be performed hourly. Note: By default, all partitions on the system drive are selected as the backup source. The backup destination cannot be on the same partition as the backup source.

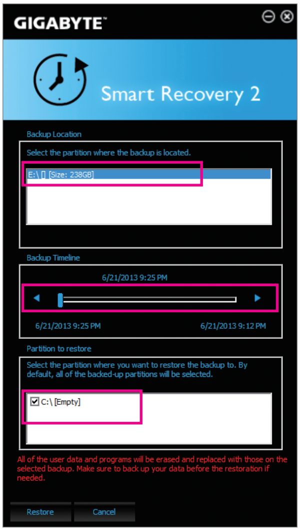
Saving the the backup to a network location:

If you want to save the backup to a network location, select **Browse network location**. Make sure your computer and the computer where you want to save the backup are in the same domain. Choose the network location where you want to store the backup and enter the user name and password. Follow the on-screen instructions to complete.


Smart Recovery 2
6/21/2013 9:25:55 PM
My Computer
C:
D:
E:
Intel
My Backup
PerfLogs
Program Files
Users
Windows
WindowsImageBackup
G:
C

Recovering a file:

Click the **File Recovery** button on the main menu. Use the time slider on the top of the popped out window to select a previous backup time. The right pane will display the backed-up partitions in the backup destination (in the **My Backup** folder). Browse to the file you want and copy it.



Select the partition where the backup is located.

E:\ [] [Size: 238GB]

6/21/2013 9:25 PM

6/21/2013 9:25 PM

6/21/2013 9:12 PM

Select the partition where you want to restore the backup to. By default, all of the backed-up partitions will be selected.

☑ C:\ [Empty]

All of the user data and programs will be erased and replaced with those on the selected backup. Make sure to back up your data before the restoration if needed.

Recovering your system with Smart Recovery 2:

Steps:

1. Click the **System Recovery** button on the main menu.
2. Select the location where your backup is saved.
3. Use the time slider to select a time point.
4. Select a partition backup created on the selected time point and click **Restore**.
5. Confirm whether to restart your system to proceed with the restore immediately or later. Once you respond "Yes" the system will restart to the Windows recovery environment. Follow the onscreen instructions to restore your system.

All of your files and programs will be deleted and replaced with those on the selected backup. If needed, be sure to make a copy of your data before the restore.

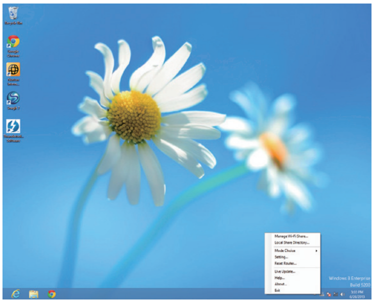
5-3 Using the Wi-Fi/Bluetooth Utilities

5-3-1 Using the Wi-Fi Share Utility

Install the drivers and utilities from the included wireless module driver disk. The Wi-Fi Share utility allows you to configure how your Wi-Fi/Bluetooth card will act. First it can turn your computer into a virtual wireless access point (Hotspot), which allows WiFi-capable computers or mobile devices to access the Internet through the virtual wireless access point. Second, it can be configured to let your computer share data to another computer by simply dragging the data from your computer to the target computer (File Transfer). Third, it surely can be used as a normal wireless LAN card (WiFi).

The Wi-Fi Share utility is supported in Windows 8/7 only.

To use Wi-Fi Share for the first time, click the Wi-Fi Share Manager icon on the **Start** screen (Windows 8) or launch it from Start\All Applications (Windows 7). Then right-click the Wi-Fi Share icon in the notification area to display configuration options.



Option Descriptions

Option	Description
Manage Wi-Fi Share	Opens the Wi-Fi Share Manager
Local Share Directory	Goes to the directory where shared files are located (File Transfer)
Mode Choice	Selects which mode to operate
Setting	Configures further settings depending on the mode selected
Reset Router	Reset the Wi-Fi Share utility
Live Update	Updates Wi-Fi Share online
Help	Displays the help file
About	Displays the Wi-Fi Share version
Exit	Exits Wi-Fi Share

Mode Selection

Wi-Fi Share provides three modes for users to select as follows:

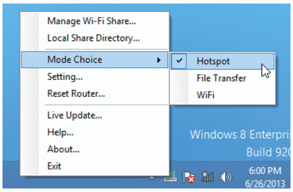
A. Hotspot

The Hotspot turns your computer into a virtual wireless access point (WAP). Refer to the steps below for detailed configurations.

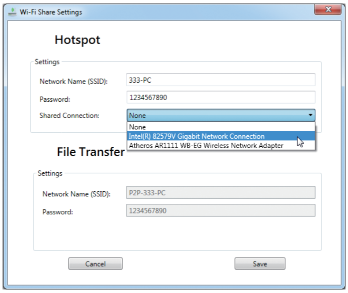
Configuring your computer:

Step 1:

Right-click the **Wi-Fi Share** icon in the notification area and select **Mode Choice** > **Hotspot** to turn your computer into a virtual wireless AP. Then select **Setting**.



Step 2:
When the **Wi-Fi Share Settings** dialog box appears, select a currently running network connection you want to share from the **Share Connection** list. Then click **Save**. The **Password** represents the network security key which is required when other computer wants to access the Internet through the virtual wireless AP. You can keep the default password or create your own one.


Wi-Fi Share Settings
Hotspot

Settings
Network Name (SSID): 333-PC
Password: 1234567890
Shared Connection: None

None
Intel(R) 82579V Gigabit Network Connection
Atheros AR1111 WB-EG Wireless Network Adapter
File Transfer

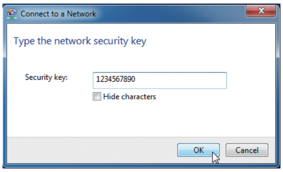
Settings
Network Name (SSID): P2P-333-PC
Password: 1234567890

Cancel
Save

Configuring the computer that wants to access the Internet through the virtual wireless AP:

Step 1:
Left-click the **Internet Access** icon in the notification area. When the **Currently connected to** list appears, select the virtual wireless AP you want to connect to and click **Connect**.

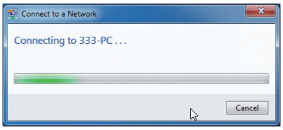
Step 2:
When the **Connect to a Network** dialog box appears, enter the security key of the network connection the virtual wireless AP is sharing and click **OK**.


Connect to a Network

Type the network security key

Security key: 1234567890
☐ Hide characters

OK
Cancel


Connect to a Network

Connecting to 333-PC . . .

Cancel

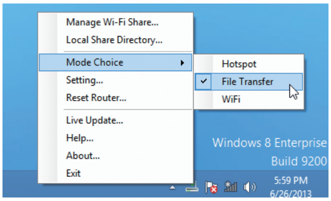
Step 3:
After the connection, the **Currently connected to** list shows that this computer is currently using the network connection shared by the virtual wireless AP.

B. File Transfer

The **File Transfer** allows two computers with File Transfer enabled to share files to each other. Note: Be sure to turn off the firewall on both computers before using File Transfer.

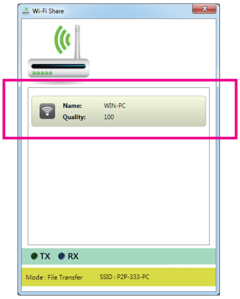
Step 1:

Make sure the two computers are installed with the Wi-Fi Share utility and have File Transfer enabled. On the desktop of the source computer, right-click the Wi-Fi Share icon in the notification area and select **Mode Choice** > **File Transfer**. Then select **Manage Wi-Fi Share** to open the Wi-Fi Share Manager.


Manage Wi-Fi Share...
Local Share Directory...
Mode Choice
Setting...
Reset Router...
Live Update...
Help...
About...
Exit
Hotspot
File Transfer
WiFi
Windows 8 Enterprise
Build 9200
5:59 PM
6/26/2013

Step 2:

The Wi-Fi Share Manager will display the other computer with File Transfer enabled (the target computer).

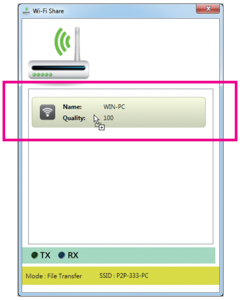

Wi-Fi Share
TX
RX

Name: WIN-PC
Quality: 100

Mode : File Transfer SSID : P2P-333-PC

Step 3:

Go the directory where the file/folder that you want to share is located. Drag the file/folder to the target computer displayed on the Wi-Fi Share Manager.

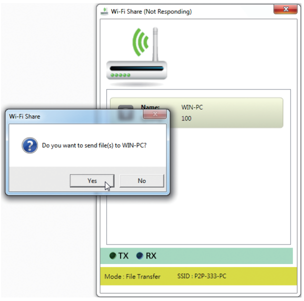

Wi-Fi Share
TX
RX

Name: WIN-PC
Quality: 100

Mode : File Transfer SSID : P2P-333-PC

Step 4:

When asked whether to send the file/folder to the target computer, click **Yes**. The **TX** light will be on when the file/data is being sent.


Wi-Fi Share (Not Responding)
Wi-Fi Share
Yes
No
TX
RX

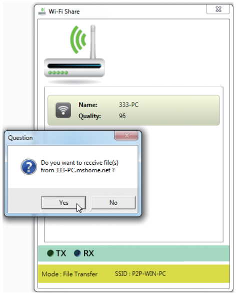
Do you want to send file(s) to WIN-PC?

Name: WIN-PC
100

Mode : File Transfer SSID : P2P-333-PC

Step 5:

The confirmation message will also appear on the target computer, asking whether to accept the file/folder from the source computer. Click **Yes** to confirm. You must respond in 15 seconds. The **RX** light will be on when the file/data is being received.


Wi-Fi Share
Question
Yes
No
TX
RX

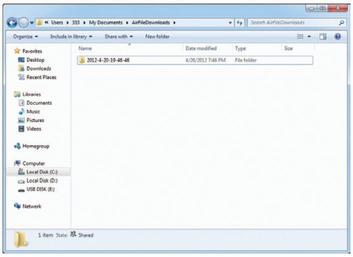
Name: 333-PC
Quality: 96

Do you want to receive file(s) from 333-PC.mshome.net ?

Mode : File Transfer
SSID : P2P-WIN-PC

Step 6:

The data will be automatically stored to a folder in the **My Documents\AirFileDownloads** directory in the target computer, which is named according to the receiving time. To directly access this directory later, you can also right-click the Wi-Fi Share icon in the notification area and select **Local Shared Directory**.


« Users ▸ 333 ▸ My Documents ▸ AirFileDownloads ▸
Search AirFileDownloads
Organize
Include in library
Share with
New folder
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Homegroup
Computer
Local Disk (C:)
Local Disk (D:)
USB DISK (E:)
Network

Name	Date modified	Type	Size
2012-4-20-19-46-46	4/26/2012 7:46 PM	File folder	

1 item State: Shared

C. WiFi

In this mode, the Wi-Fi/Bluetooth card is set as a normal wireless LAN card and needs to connect to a wireless access point to get Internet connection.

5-3-2 Using the Cloud Station Utility

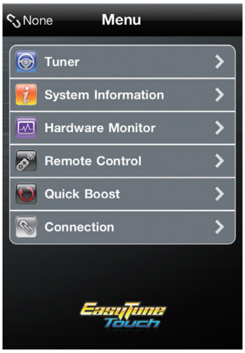
The Cloud Station utility allows GIGABYTE's iOS APPs to communicate, share resources, and control your desktop PC systems. Two GIGABYTE's unique iOS APPs are available now: EasyTune Touch and PictureView, both of which can be downloaded from the Apple store for free.

System Requirements:

- Windows 8/7
- i-Tunes
- iPhone 5, iPhone 4, iPhone 3, and iPad series
  (iPhone 3 and iPad series only support Wi-Fi connection)

EasyTune Touch:

EasyTune Touch is a simple and easy-to-use application that allows users to remotely control their system through Apple devices, including iPhone and iPAD. Detailed functions are as follows:



Option Descriptions

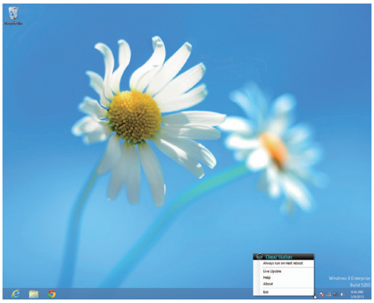
Option	Description
Tuner	Allows you to change CPU/memory frequency and voltage settings.
System Information	Displays the system information, including the CPU, motherboard, and memory.
Hardware Monitor	Allows you to monitor hardware temperature, voltage, and fan speed.
Remote Control	Allows you to reboot or shut dwn your computer.
Quick Boost	Provides you with 3 levels of automatic system tuning.
Connection	Selects how iPhone/iPad will connect to your computer.

PictureView:

The PictureView application is designed to allow users to quickly and effortlessly share photographs from their iOS device directly to their computer. By simply selecting a photo from the iOS device's picture library, the user will then be instantly able to see it on their PC desktop.

Using the Cloud Station:

After the Cloud Station utility is installed, the Cloud Station icon will appear in the notification area. You can right-click this icon and select **Always run on next reboot** to launch this utility each time you reboot the computer. To use EasyTune Touch and PictureView on your iPhone/iPad, you must launch the Cloud Station utility on your computer first.


Cloud Station
Always run on next reboot
Live Update
Help
About
Exit
Windows 8 Enterprise
Build 9200
9:30 AM
5/9/2013

Three ways of connection:

Before using EasyTune Touch and PictureView, use one of the three ways below to connect your Apple devices to the target computer: Wi-Fi, Bluetooth, and USB connections. iPhone 3 and iPad series only support Wi-Fi connection and iPhone 4/5 series supports all of the three connections. Below we use iPhone 4 as the demonstration Apple device. (Make sure i-Tunes is installed first.)

A. Wi-Fi Connection:

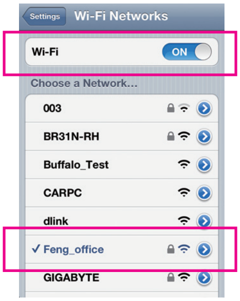
Make sure your iPhone and computer are using the same network connection.

Step 1:

Make sure your computer is connected to a network connection.

Step 2:

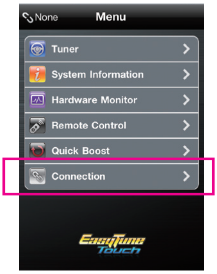
On your iPhone, go to **Settings>Wi-Fi** and turn on the Wi-Fi function. Then choose the same network connection that your computer is currently using.


Settings
Wi-Fi Networks
Wi-Fi
ON
Choose a Network...
003
BR31N-RH
Buffalo_Test
CARPC
dlink
✓ Feng_office
GIGABYTE

Using EasyTune Touch

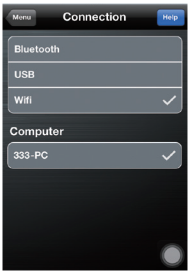
Step 1:

Go to the main menu of the EasyTune Touch application on your iPhone. Select **Connection**.


None
Menu
Tuner
System Information
Hardware Monitor
Remote Control
Quick Boost
Connection
EasyTune Touch

Step 2:

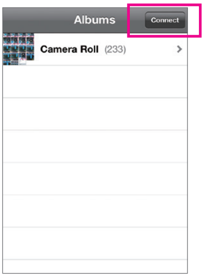
On the **Connection** page, select **Wifi**. iPhone will begin to search for the computer using the same network connection. When the computer is displayed, select it. Then return to the main menu of the EasyTune Touch application. Now you are able to use the EasyTune Touch functions to remotely control the target computer via the iPhone or check hardware information.


Menu
Connection
Help
Bluetooth
USB
Wifi ✓
Computer
333-PC ✓

Using PictureView

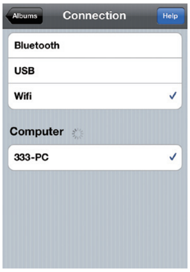
Step 1:

Go to the main screen of the PictureView application. In the photo gallery, select **Connect**.

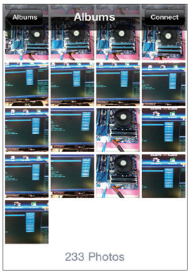

Albums
Connect
Camera Roll (233)

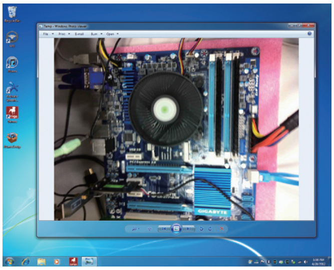
Step 2:

On the **Connection** page, select **Wifi**. iPhone will begin to search for the computer using the same network connection. When the computer is displayed, select it. Then return to photo gallery.


Albums
Connection
Help
Bluetooth
USB
Wifi ✓
Computer
333-PC ✓

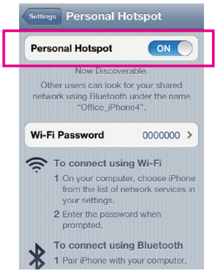
Step 3:
Click the photo you want to share and your photo will be shown instantly on the desktop of the target computer.





B. BlueTooth Connection:

Step 1:
On your iPhone, go to **Settings > Personal Hotspot** and turn on this function. Then go to **Settings > General > Bluetooth** to turn Bluetooth on.



Personal Hotspot ON

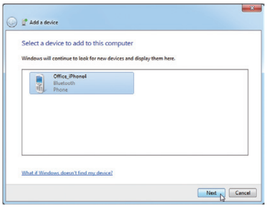
Now Discoverable.
Other users can look for your shared network using Bluetooth under the name "Office_iPhone4".

Wi-Fi Password 0000000

To connect using Wi-Fi
1 On your computer, choose iPhone from the list of network services in your settings.
2 Enter the password when prompted.

To connect using Bluetooth
1 Pair iPhone with your computer.

Step 2:
Now you have to pair the iPhone with your computer. In the operating system of your computer, go to **Control Panel > Devices and Printers**. Select **Add a device**. Your computer will look for Bluetooth devices and display them on the screen. When the iPhone is displayed, select it and click **Next**.



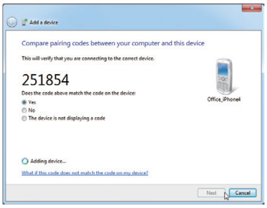
Select a device to add to this computer

Windows will continue to look for new devices and display them here.

Office_iPhone4
Bluetooth
Phone

What if Windows doesn't find my device?

Step 3:
A pairing code will appear on the screen. You iPhone will display a message with the pairing code for you to confirm as well (refer to the next screenshot). Click **Next**.



Compare pairing codes between your computer and this device

This will verify that you are connecting to the correct device.

251854

Does the code above match the code on the device:

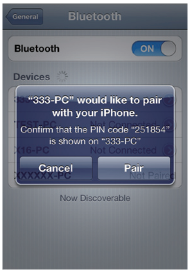
● Yes
○ No
○ The device is not displaying a code

Adding device...

What if this code does not match the code on my device?

Step 4:

When the iPhone displays the pairing code, press **Pair** to confirm. After the pairing is successful, your iPhone will show that it has been connected to your computer.

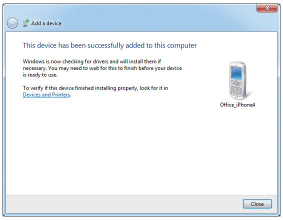

General
Bluetooth
Bluetooth
ON
Devices
TEST-PC
Not Connected
X16-PC
Not Connected
XXXXXX-PC
Cancel
Pair
Now Discoverable

"333-PC" would like to pair with your iPhone.

Confirm that the PIN code "251854" is shown on "333-PC"

Step 5:

Your computer will show that the iPhone has been added to your computer successfully. Click **Close** to return to the **Control Panel > Devices and Printers** window.


Add a device
Office_iPhone4
Close

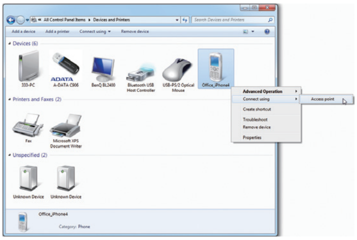
This device has been successfully added to this computer

Windows is now checking for drivers and will install them if necessary. You may need to wait for this to finish before your device is ready to use.

To verify if this device finished installing properly, look for it in Devices and Printers.

Step 6:

Look for your iPhone device, right-click it, and select **Connect using > Access Point** to complete the configuration.

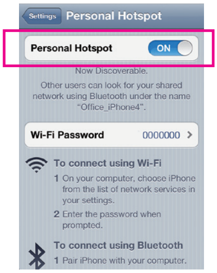

All Control Panel Items
Devices and Printers
Search Devices and Printers
Add a device
Add a printer
Connect using
Remove device
Devices (6)
333-PC
ADATA
A-DATA C906
BenQ BL2400
Bluetooth USB Host Controller
USB-PS/2 Optical Mouse
Office_iPhone4
Advanced Operation
Connect using
Access point
Create shortcut
Troubleshoot
Remove device
Properties
Printers and Faxes (2)
Fax
Microsoft XPS Document Writer
Unspecified (2)
Unknown Device
Unknown Device
Office_iPhone4
Category: Phone

Now, you are ready to use EasyTune Touch or PictureView. Refer to the instructions on configuration Wi-Fi connection and select **Bluetooth** connection.

C. USB Connection:

Step 1:

On your iPhone, go to **Settings > Personal Hotspot** and turn on this function.


Settings
Personal Hotspot

Personal Hotspot ON

Now Discoverable.
Other users can look for your shared network using Bluetooth under the name "Office_iPhone4".

Wi-Fi Password 0000000

To connect using Wi-Fi
1 On your computer, choose iPhone from the list of network services in your settings.
2 Enter the password when prompted.

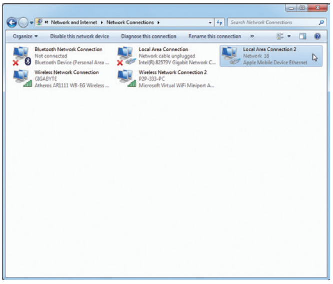
To connect using Bluetooth
1 Pair iPhone with your computer.

Step 2:

Connect your iPhone to your computer using the iPhone USB cable.

Step 3:

After the iPhone is connected to your computer, go to **Control Panel > Network and Sharing Center > Change adapter settings**. Make sure **Apple Mobile Device Ethernet** is present. If not, re-check the connection.


« Network and Internet ▸ Network Connections ▸
Search Network Connections
Organize ▾
Disable this network device
Diagnose this connection
Rename this connection
»

Bluetooth Network Connection
Not connected
Bluetooth Device (Personal Area ...

Local Area Connection
Network cable unplugged
Intel(R) 82579V Gigabit Network C...

Local Area Connection 2
Network 18
Apple Mobile Device Ethernet

Wireless Network Connection
GIGABYTE
Atheros AR1111 WB-EG Wireless ...

Wireless Network Connection 2
P2P-333-PC
Microsoft Virtual WiFi Miniport A...

Now, you are ready to use EasyTune Touch or PictureView. Refer to the instructions on configuration Wi-Fi connection and select **USB** connection.

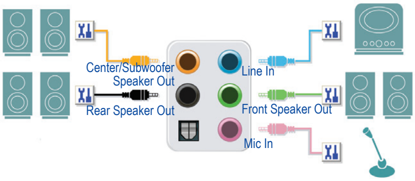
Chapter 6 Appendix

6-1 Configuring Audio Input and Output

6-1-1 Configuring 2/4/5.1/7.1-Channel Audio

The motherboard provides five audio jacks on the back panel which support 2/4/5.1/7.1-channel (Note) audio. The picture to the right shows the default audio jack assignments.

The integrated HD (High Definition) audio provides jack retasking capability that allows the user to change the function for each jack (except for the Line Out jack) through the audio driver.



- To install a microphone, connect your microphone to the Mic in jack and manually configure the jack for microphone functionality.
- To configure 4/5.1/7.1-channel audio, you have to retask one of the audio jacks to be Side speaker out through the audio driver.
- Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to instructions on the next page.

High Definition Audio (HD Audio)

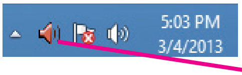
HD Audio includes multiple high quality digital-to-analog converters (DACs). HD Audio features multistreaming capabilities that allow multiple audio streams (in and out) to be simultaneously processed. For example, users can listen to MP3 music, have an Internet chat, make a telephone call over the Internet, and etc. all at the same time.

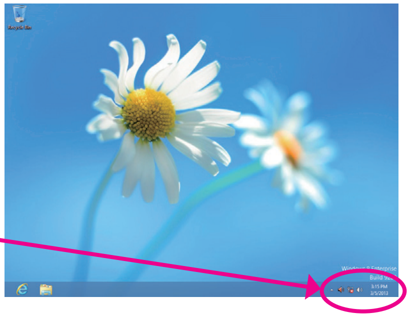
A. Configuring Speakers

(The following instructions use Windows 8 as the example operating system.)

Step 1:

After installing the audio driver, restart your computer. Then switch to Windows desktop mode. The **HD Audio Manager** icon 🔊 will appear in the notification area. Double-click the icon to access the **HD Audio Manager**.





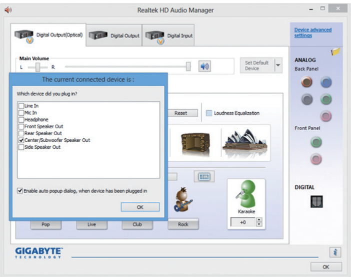
(Note) 2/4/5.1/7.1-Channel Audio Configurations:

Refer to the following for multi-channel speaker configurations.

- 2-channel audio: Headphone or Line out.
- 4-channel audio: Front speaker out and Rear speaker out.
- 5.1-channel audio: Front speaker out, Rear speaker out, and Center/Subwoofer speaker out.
- 7.1-channel audio: Front speaker out, Rear speaker out, Center/Subwoofer speaker out, and Side speaker out.

Step 2:

Connect an audio device to an audio jack. The **The current connected device is** dialog box appears. Select the device according to the type of device you connect. Then click **OK**.


Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Digital Input
Main Volume
Device advanced settings
ANALOG
Back Panel
Front Panel
DIGITAL
Pop
Live
Club
Rock
Karaoke
GIGABYTE TECHNOLOGY

The current connected device is :

Which device did you plug in?

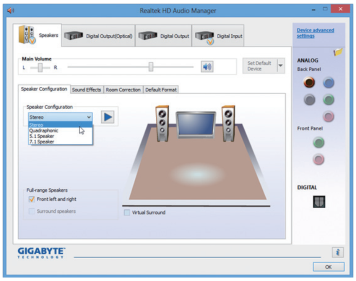
☐ Line In
☐ Mic In
☐ Headphone
☐ Front Speaker Out
☐ Rear Speaker Out
☑ Center/Subwoofer Speaker Out
☐ Side Speaker Out

☑ Enable auto popup dialog, when device has been plugged in

OK

Step 3:

On the **Speakers** screen, click the **Speaker Configuration** tab. In the **Speaker Configuration** list, select **Stereo**, **Quadraphonic**, **5.1 Speaker**, or **7.1 Speaker** according to the type of speaker configuration you wish to set up. Then the speaker setup is completed.

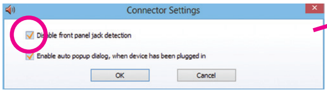

Realtek HD Audio Manager
Speakers
Digital Output(Optical)
Digital Output
Digital Input
Main Volume
Speaker Configuration
Sound Effects
Room Correction
Default Format
Stereo
Quadraphonic
5.1 Speaker
7.1 Speaker
Full-range Speakers
Front left and right
Surround speakers
Virtual Surround
Device advanced settings
ANALOG
Back Panel
Front Panel
DIGITAL
GIGABYTE TECHNOLOGY

B. Configuring Sound Effect

You may configure an audio environment on the **Sound Effects** tab.

C. Activating an AC'97 Front Panel Audio Module

If your chassis provides an AC'97 front panel audio module, to activate the AC'97 functionality, click the tool icon on the **Speaker Configuration** tab. On the **Connector Settings** dialog box, select the **Disable front panel jack detection** check box. Click **OK** to complete.

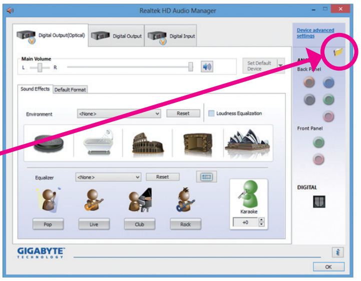


Connector Settings

☑ Disable front panel jack detection

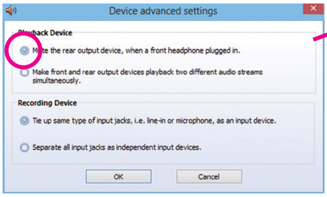
☑ Enable auto popup dialog, when device has been plugged in

OK Cancel


Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Digital Input
Main Volume
Sound Effects
Default Format
Environment
<None>
Reset
Loudness Equalization
Equalizer
Pop
Live
Club
Rock
Karaoke
Device advanced settings
ANALOG
Back Panel
Front Panel
DIGITAL
GIGABYTE TECHNOLOGY

D. Muting the Back Panel Audio (For HD Audio Only)

Click **Device advanced settings** on the top right corner on the **Speaker Configuration** tab to open the **Device advanced settings** dialog box. Select the **Mute the rear output device, when a front headphone plugged in** check box. Click **OK** to complete.



Device advanced settings

Playback Device

● Mute the rear output device, when a front headphone plugged in.

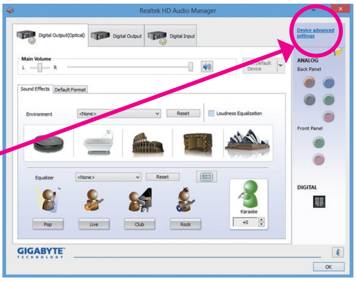
○ Make front and rear output devices playback two different audio streams simultaneously.

Recording Device

● Tie up same type of input jacks, i.e. line-in or microphone, as an input device.

○ Separate all input jacks as independent input devices.

OK Cancel


Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Digital Input
Main Volume
Sound Effects
Default Format
Environment
<None>
Reset
Loudness Equalization
Equalizer
Pop
Live
Club
Rock
Karaoke
Device advanced settings
ANALOG
Back Panel
Front Panel
DIGITAL
GIGABYTE TECHNOLOGY

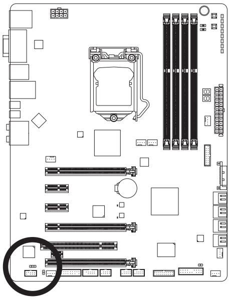
6-1-2 Configuring S/PDIF In/Out

A. S/PDIF In

The S/PDIF In cable (optional) allows you to input digital audio signals to the computer for audio processing.

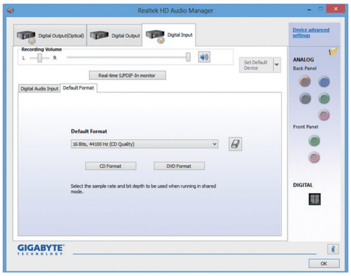
1. Connecting a S/PDIF In Cable:

Connect a S/PDIF in cable to the SPDIF_IN header on the motherboard as shown below.



2. Configuring S/PDIF In:

On the **Digital Input** screen, click the **Default Format** tab and then select the sample rate and bit depth. Click **OK** to complete.



Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Digital Input
Recording Volume
L
R
Set Default Device
Real-time S/PDIF-In monitor
Digital Audio Input
Default Format
CD Format
DVD Format
Device advanced settings
ANALOG
Back Panel
Front Panel
DIGITAL
GIGABYTE TECHNOLOGY
OK

Default Format: 16 Bits, 44100 Hz (CD Quality)

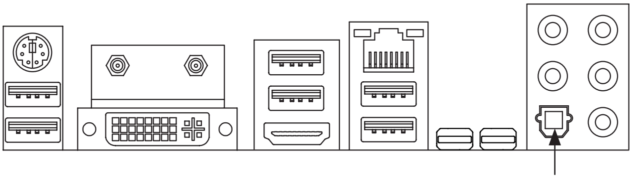
Select the sample rate and bit depth to be used when running in shared mode.

B. S/PDIF Out

The S/PDIF Out jack can transmit audio signals to an external decoder for decoding to get the best audio quality.

1. Connecting a S/PDIF Out Cable:

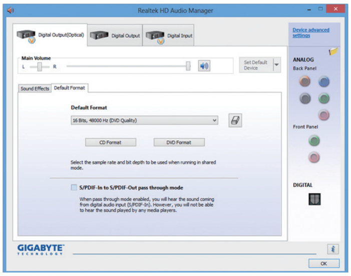
Connect a S/PDIF optical cable to the corresponding S/PDIF out connector as shown below and an external decoder for transmitting the S/PDIF digital audio signals.



Connects to a S/PDIF optical cable

2. Configuring S/PDIF Out:

On the **Digital Output(Optical)** screen (Note), click the **Default Format** tab and then select the sample rate and bit depth. Click **OK** to complete.


Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Digital Input
Device advanced settings
Main Volume
L
R
Set Default Device
Sound Effects
Default Format
ANALOG
Back Panel
Front Panel
DIGITAL
CD Format
DVD Format
GIGABYTE TECHNOLOGY
OK

Default Format: 16 Bits, 48000 Hz (DVD Quality)

Select the sample rate and bit depth to be used when running in shared mode.

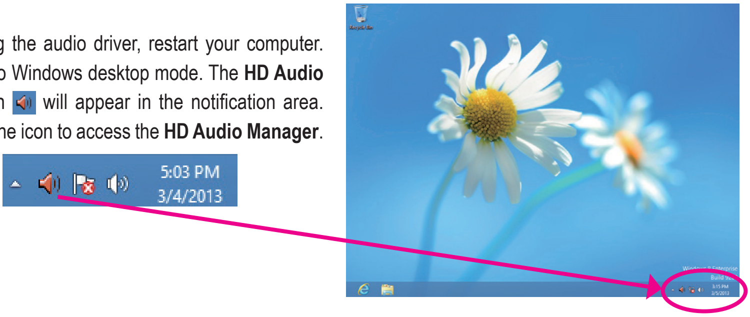
☐ S/PDIF-In to S/PDIF-Out pass through mode

When pass through mode enabled, you will hear the sound coming from digital audio input (S/PDIF-In). However, you will not be able to hear the sound played by any media players.

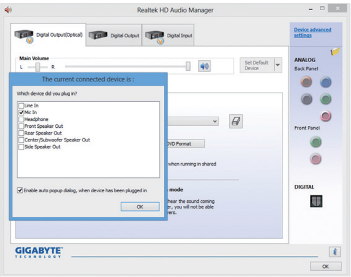
(Note) Enter the **Digital Output(Optical)** screen to configure further settings if you use the S/PDIF Out connector(s) on the back panel for digital audio output or enter the **Digital Output** screen if you use the internal S/PDIF Out connector (SPDIF_O) for digital audio output.

6-1-3 Configuring Microphone Recording

Step 1:
After installing the audio driver, restart your computer. Then switch to Windows desktop mode. The **HD Audio Manager** icon 🔊 will appear in the notification area. Double-click the icon to access the **HD Audio Manager**.


5:03 PM
3/4/2013
Windows 8 Enterprise
Build 92
3:15 PM
3/5/2013

Step 2:
Connect your microphone to the Mic in jack (pink) on the back panel or the Mic in jack (pink) on the front panel. Then configure the jack for microphone functionality.
Note: The microphone functions on the front panel and back panel cannot be used at the same time.


Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Digital Input
Main Volume
L
R
Set Default Device
Device advanced settings
ANALOG
Back Panel
Front Panel
DIGITAL
GIGABYTE TECHNOLOGY
OK

The current connected device is :

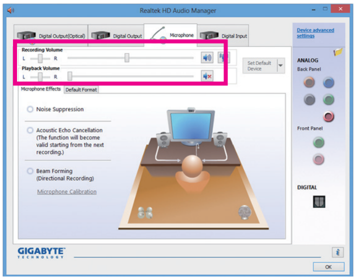
Which device did you plug in?

☐ Line In
☑ Mic In
☐ Headphone
☐ Front Speaker Out
☐ Rear Speaker Out
☐ Center/Subwoofer Speaker Out
☐ Side Speaker Out

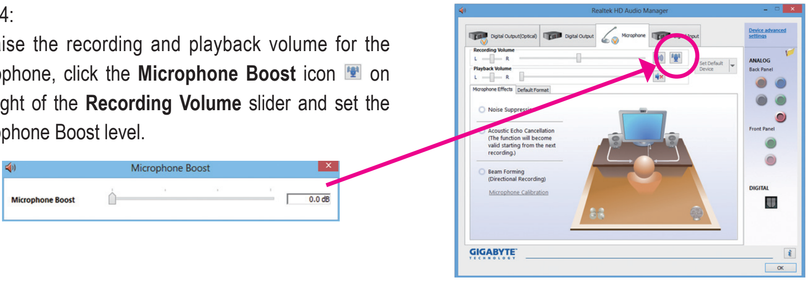
☑ Enable auto popup dialog, when device has been plugged in

OK

Step 3:
Go to the **Microphone** screen. Do not mute the recording volume, or you'll not be able to record the sound. To hear the sound being recorded during the recording process, do not mute the playback volume. It is recommended that you set the volumes at a middle level.

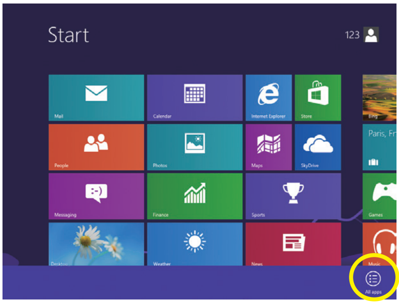

Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Microphone
Digital Input
Recording Volume
Playback Volume
L
R
Set Default Device
Microphone Effects
Default Format
Noise Suppression
Acoustic Echo Cancellation (The function will become valid starting from the next recording.)
Beam Forming (Directional Recording)
Microphone Calibration
Device advanced settings
ANALOG
Back Panel
Front Panel
DIGITAL
GIGABYTE TECHNOLOGY
OK

Step 4:
To raise the recording and playback volume for the microphone, click the **Microphone Boost** icon 🎤 on the right of the **Recording Volume** slider and set the Microphone Boost level.


Microphone Boost
Microphone Boost
0.0 dB
Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Microphone
Digital Input
Recording Volume
Playback Volume
Set Default Device
Microphone Effects
Default Format
Noise Suppression
Acoustic Echo Cancellation (The function will become valid starting from the next recording.)
Beam Forming (Directional Recording)
Microphone Calibration
Device advanced settings
ANALOG
Back Panel
Front Panel
DIGITAL
GIGABYTE TECHNOLOGY
OK

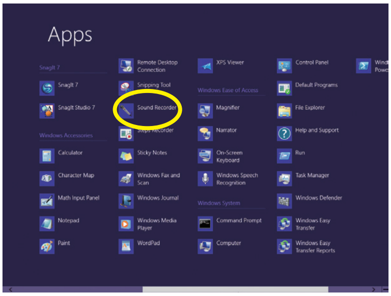
Step 5:

To open the **Sound Recorder,** move the mouse cursor to the bottom left corner of the screen, click the Start icon to switch to the **Start** screen (or press the Windows button on the keyboard). Right-click on the screen and click the **All apps** icon on the bottom right corner of the screen to access the **Apps** screen.


Start
123
Mail
Calendar
Internet Explorer
Store
People
Photos
Maps
SkyDrive
Messaging
Finance
Sports
Games
Desktop
Weather
News
Music
All apps

Step 6:

On this screen, click **Sound Recorder** for audio recording.

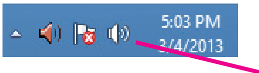

Apps
SnagIt 7
SnagIt 7
SnagIt Studio 7
Windows Accessories
Calculator
Character Map
Math Input Panel
Notepad
Paint
Remote Desktop Connection
Snipping Tool
Sound Recorder
Steps Recorder
Sticky Notes
Windows Fax and Scan
Windows Journal
Windows Media Player
WordPad
XPS Viewer
Windows Ease of Access
Magnifier
Narrator
On-Screen Keyboard
Windows Speech Recognition
Windows System
Command Prompt
Computer
Control Panel
Default Programs
File Explorer
Help and Support
Run
Task Manager
Windows Defender
Windows Easy Transfer
Windows Easy Transfer Reports

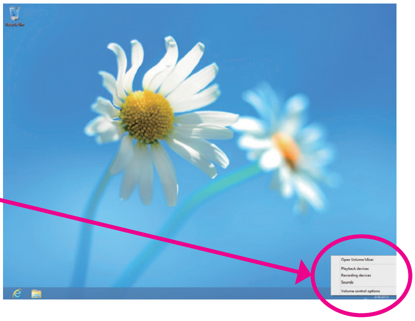
* Enabling Stereo Mix

If the HD Audio Manager does not display the recording device you wish to use, refer to the steps below. The following steps explain how to enable Stereo Mix (which may be needed when you want to record sound from your computer).

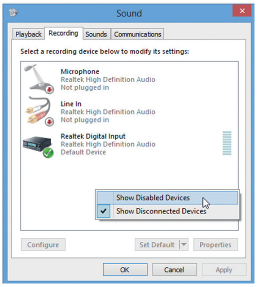
Step 1:

Locate the icon in the notification area and right-click on this icon. Select **Recording Devices**.


5:03 PM
3/4/2013


Open Volume Mixer
Playback devices
Recording devices
Sounds
Volume control options

Step 2:
On the **Recording** tab, right-click on an empty space and select **Show Disabled Devices**.


Sound
Playback
Recording
Sounds
Communications

Select a recording device below to modify its settings:

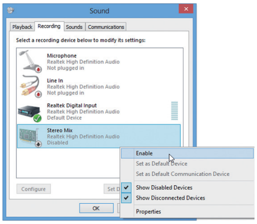
Microphone
Realtek High Definition Audio
Not plugged in

Line In
Realtek High Definition Audio
Not plugged in

Realtek Digital Input
Realtek High Definition Audio
Default Device

Show Disabled Devices
✓ Show Disconnected Devices
Configure
Set Default
Properties
OK
Cancel
Apply

Step 3:
When the **Stereo Mix** item appears, right-click on this item and select **Enable**. Then set it as the default device.


Sound
Playback
Recording
Sounds
Communications

Select a recording device below to modify its settings:

Microphone
Realtek High Definition Audio
Not plugged in

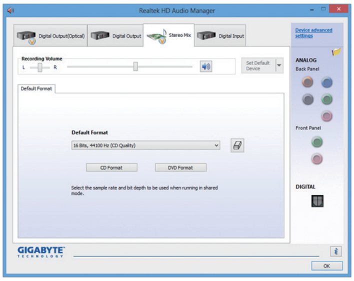
Line In
Realtek High Definition Audio
Not plugged in

Realtek Digital Input
Realtek High Definition Audio
Default Device

Stereo Mix
Realtek High Definition Audio
Disabled

Enable
Set as Default Device
Set as Default Communication Device
✓ Show Disabled Devices
✓ Show Disconnected Devices
Properties
Configure
Set D
OK

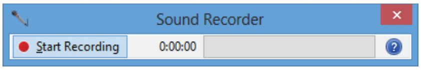
Step 4:
Now you can access the **HD Audio Manager** to configure **Stereo Mix** and use **Sound Recorder** to record the sound.


Realtek HD Audio Manager
Digital Output(Optical)
Digital Output
Stereo Mix
Digital Input
Device advanced settings
Recording Volume
L
R
Set Default Device
Default Format
ANALOG
Back Panel
Front Panel
DIGITAL
CD Format
DVD Format
GIGABYTE TECHNOLOGY
OK

Default Format
16 Bits, 44100 Hz (CD Quality)

Select the sample rate and bit depth to be used when running in shared mode.

6-1-4 Using the Sound Recorder


Sound Recorder
Start Recording
0:00:00

A. Recording Sound

1. Make sure you have connected the sound input device (e.g. microphone) to the computer.
2. To record the audio, click the **Start Recording** button ● Start Recording.
3. To stop recording audio, click the **Stop Recording** button ■ Stop Recording.

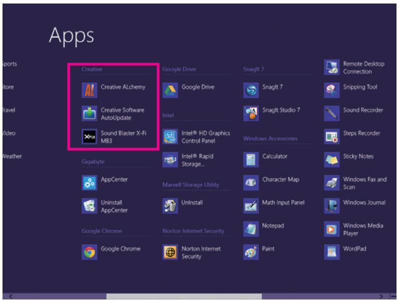
Be sure to save the recorded audio file upon completion.

B. Playing the Recorded Sound

You can play your recording in a digital media player program that supports your audio file format.

6-1-5 Creative Software Suite

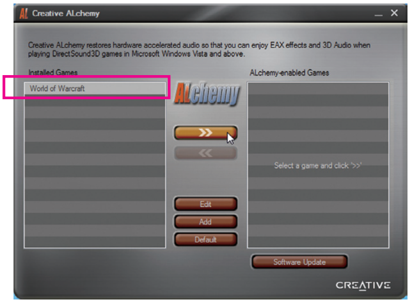
After installing the audio driver, you can find the Creative Software Suite in All apps>Creative.
The Creative Software Suite includes the Creative Software AutoUpdate, Alchemy, and Sound Blaster X-Fi MB3.


Apps
Creative
Creative ALchemy
Creative Software AutoUpdate
Sound Blaster X-Fi MB3
Gigabyte
AppCenter
Uninstall AppCenter
Google Chrome
Google Chrome
Google Drive
Google Drive
Intel
Intel® HD Graphics Control Panel
Intel® Rapid Storage...
Marvell Storage Utility
Uninstall
Norton Internet Security
Norton Internet Security
SnagIt 7
SnagIt 7
SnagIt Studio 7
Windows Accessories
Calculator
Character Map
Math Input Panel
Notepad
Paint
Remote Desktop Connection
Snipping Tool
Sound Recorder
Steps Recorder
Sticky Notes
Windows Fax and Scan
Windows Journal
Windows Media Player
WordPad

Creative Alchemy

Through the Creative Alchemy, you can enable EAX effects for your games to obtain the most realistic gaming experience.

Go to All apps>Creative to launch Creative Alchemy. On the left panel, select the game for which you want to enable the EAX effects and add it to the right panel. You will see the EAX effects are enabled when the game is launched.


Creative ALchemy

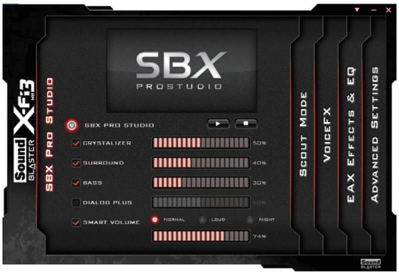
Creative ALchemy restores hardware accelerated audio so that you can enjoy EAX effects and 3D Audio when playing DirectSound3D games in Microsoft Windows Vista and above.

Installed Games
World of Warcraft
ALchemy
ALchemy-enabled Games
Select a game and click '>>'
Edit
Add
Default
Software Update
CREATIVE

Sound Blaster X-Fi MB3

Go to All apps>Creative to open the Sound Blaster X-Fi MB3.

SBX PRO STUDIO:


SBX
PROSTUDIO
Sound BLASTER X-Fi3 MB
SBX Pro Studio
Scout Mode
VoiceFX
EAX Effects & EQ
Advanced Settings

○ SBX PRO STUDIO

☑ CRYSTALIZER 50%

☑ SURROUND 40%

☑ BASS 30%

☐ DIALOG PLUS 50%

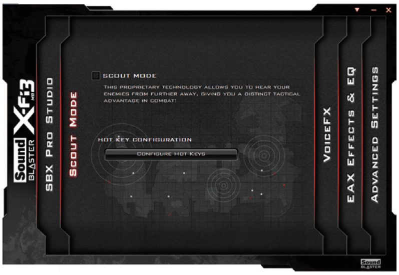
☑ SMART VOLUME ● NORMAL ○ LOUD ○ NIGHT 74%

Click the SBX PRO STUDIO icon to enable or disable it. The sliders on the right side allow you to adjust the enhancement level for each feature.

- CRYSTALIZER
  Makes the music sound as good as the artist originally intended and adds an enhanced level of realism for movies and games.
- SURROUND
  Provides immersion control to enhance the natural sense of audio depth and spaciousness by creating virtual surround sound channels.
- BASS
  This feature is available only when a stereo speaker or headphone is installed. It fills in the missing low frequency tones and gives the extra impact for a better entertainment experience. The Crossover Frequency feature is available only when a 2-channel stereo speaker system is installed.
- DIALOG PLUS
  Enhances the voices in movies for clearer dialog, allowing the listener to hear the dialog over the rest of the soundtrack and over ambient noise in the listening environment.
- SMART VOLUME
  Addresses the problem of abrupt volume level changes during playback and between songs by automatically and continuously measuring volume, and intelligently applying gain and attenuation to compensate for those changes.

SCOUT MODE:

This page allows you to enable or disable Scout Mode. This feature enables you to hear your opponents from further away in FPS games, giving you a distinct tactical advantage in combat. You can set hot keys which can be used enable or disable this feature during games.

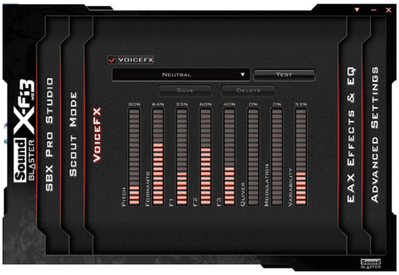

Sound BLASTER X-Fi3 MB
SBX Pro Studio
Scout Mode
VoiceFX
EAX Effects & EQ
Advanced Settings
Hot Key Configuration
Configure Hot Keys

☐ SCOUT MODE

THIS PROPRIETARY TECHNOLOGY ALLOWS YOU TO HEAR YOUR ENEMIES FROM FURTHER AWAY, GIVING YOU A DISTINCT TACTICAL ADVANTAGE IN COMBAT!

VOICEFX:

Morphs your voice into different characters and accents.


Sound BLASTER X-Fi3 MB
SBX Pro Studio
Scout Mode
VoiceFX
EAX Effects & EQ
Advanced Settings
Test
Save
Delete

☑ VOICEFX

Neutral

Pitch 20%

Formants 64%

F1 33%

F2 60%

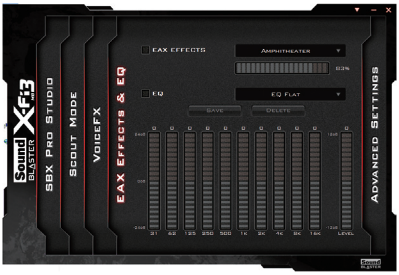
F3 40%

Quiver 0%

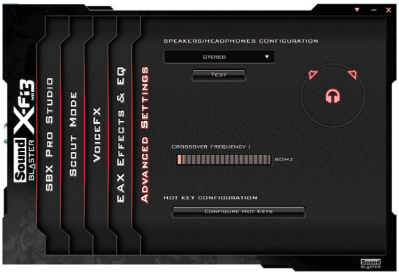
Modulation 0%

Variability 33%

EAX EFFECTS & EQ:
This panel allows you to enable EAX effects and adjust the strength of certain frequencies for your audio signals.


SBX Pro Studio
Scout Mode
VoiceFX
EAX Effects & EQ
Advanced Settings
☐ EAX Effects
Amphitheater
☐ EQ
EQ Flat
Save
Delete
31
62
125
250
500
1K
2K
4K
8K
16K
Level

ADVANCED SETTING:
This page allows you to set the output device to speakers or headphones and set up your speaker/headphone configurations. (Note: Speakers and headphones cannot be used at the same time. When the headphone function is selected, the sound will come out only from the front line out or rear headphone jack.)


SBX Pro Studio
Scout Mode
VoiceFX
EAX Effects & EQ
Advanced Settings
Speakers/Headphones Configuration
Stereo
Test
Crossover Frequency :
80Hz
Hot Key Configuration
Configure Hot Keys

6-2 Troubleshooting

6-2-1 Frequently Asked Questions

To read more FAQs for your motherboard, please go to the **Support & Downloads\FAQ** page on GIGABYTE's website.

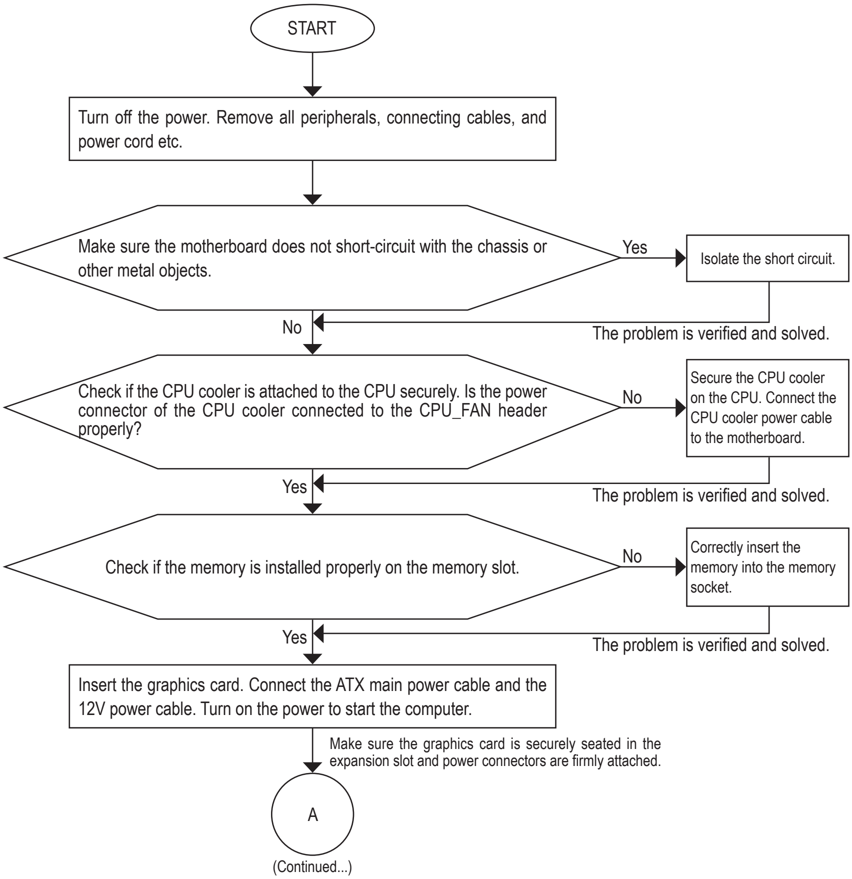
Q: Why is the light of my keyboard/optical mouse still on after the computer shuts down?
A: Some motherboards provide a small amount of standby power after the computer shuts down and that's why the light is still on.

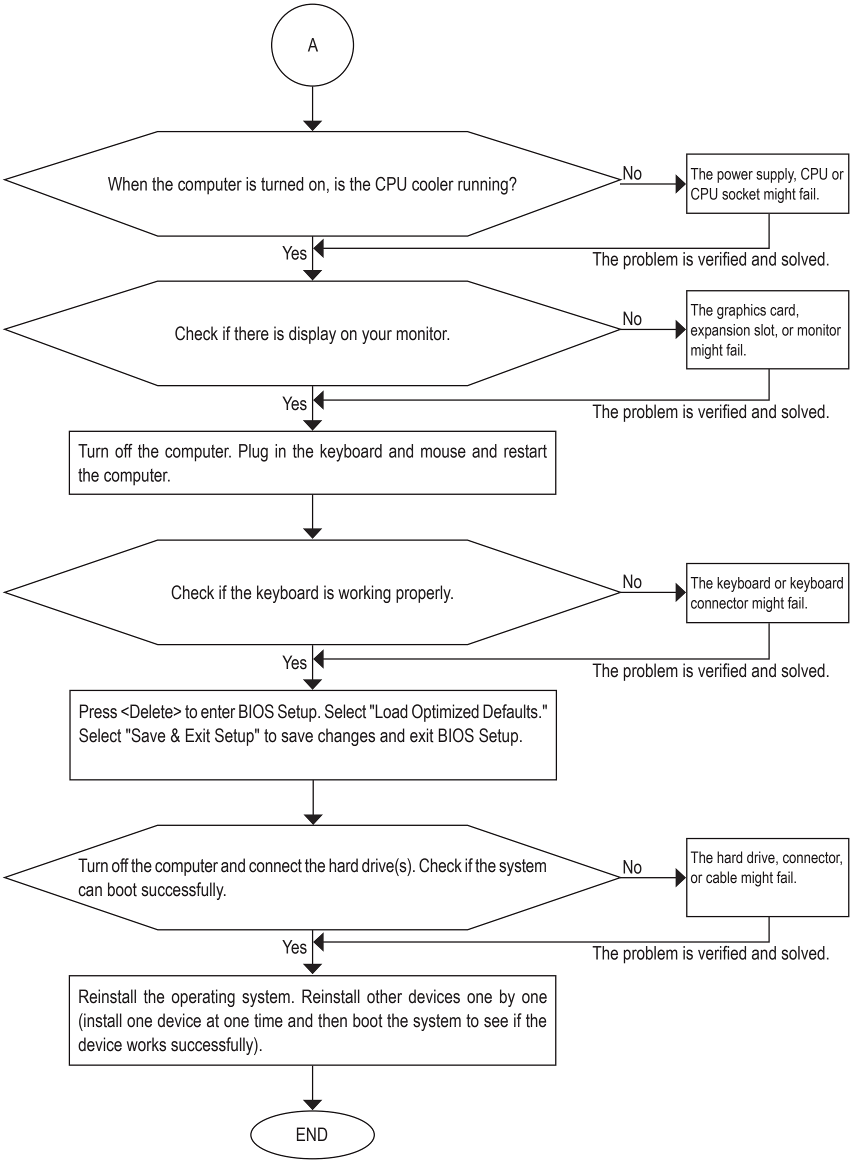
Q: How do I clear the CMOS values?
A: For motherboards that have a Clear CMOS button, press this button to clear the CMOS values (before doing this, please turn off the computer and unplug the power cord). For motherboards that have a Clear CMOS jumper, refer to the instructions in Chapter 1 to short the jumper to clear the CMOS values. If your board doesn't have this jumper/button, refer to the instructions on the motherboard battery in Chapter 1. You can temporarily remove the battery from the battery holder to stop supplying power to the CMOS, which will clear the CMOS values after about one minute.

Q: Why do I still get a weak sound even though I have turned my speaker to the maximum volume?
A: Make sure your speaker is equipped with an internal amplifier. If not, try a speaker with power/amplifier.

6-2-2 Troubleshooting Procedure

If you encounter any troubles during system startup, follow the troubleshooting procedure below to solve the problem.


START
Turn off the power. Remove all peripherals, connecting cables, and power cord etc.
Make sure the motherboard does not short-circuit with the chassis or other metal objects.
Yes
Isolate the short circuit.
No
The problem is verified and solved.
Check if the CPU cooler is attached to the CPU securely. Is the power connector of the CPU cooler connected to the CPU_FAN header properly?
No
Secure the CPU cooler on the CPU. Connect the CPU cooler power cable to the motherboard.
Yes
The problem is verified and solved.
Check if the memory is installed properly on the memory slot.
No
Correctly insert the memory into the memory socket.
Yes
The problem is verified and solved.
Insert the graphics card. Connect the ATX main power cable and the 12V power cable. Turn on the power to start the computer.
Make sure the graphics card is securely seated in the expansion slot and power connectors are firmly attached.
A
(Continued...)


A
When the computer is turned on, is the CPU cooler running?
No
The power supply, CPU or CPU socket might fail.
Yes
The problem is verified and solved.
Check if there is display on your monitor.
No
The graphics card, expansion slot, or monitor might fail.
Yes
The problem is verified and solved.
Turn off the computer. Plug in the keyboard and mouse and restart the computer.
Check if the keyboard is working properly.
No
The keyboard or keyboard connector might fail.
Yes
The problem is verified and solved.
Press <Delete> to enter BIOS Setup. Select "Load Optimized Defaults." Select "Save & Exit Setup" to save changes and exit BIOS Setup.
Turn off the computer and connect the hard drive(s). Check if the system can boot successfully.
No
The hard drive, connector, or cable might fail.
Yes
The problem is verified and solved.
Reinstall the operating system. Reinstall other devices one by one (install one device at one time and then boot the system to see if the device works successfully).
END

If the procedure above is unable to solve your problem, contact the place of purchase or local dealer for help. Or go to the **Support & Downloads\Technical Support** page to submit your question. Our customer service staff will reply you as soon as possible.

6-3 Debug LED Codes

Regular Boot

Code	Description
10	PEI Core is started.
11	Pre-memory CPU initialization is started.
12~14	Reserved.
15	Pre-memory North-Bridge initialization is started.
16~18	Reserved.
19	Pre-memory South-Bridge initialization is started.
1A~2A	Reserved.
2B~2F	Memory initialization.
31	Memory installed.
32~36	CPU PEI initialization.
37~3A	IOH PEI initialization.
3B~3E	PCH PEI initialization.
3F~4F	Reserved.
60	DXE Core is started.
61	NVRAM initialization.
62	Installation of the PCH runtime services.
63~67	CPU DXE initialization is started.
68	PCI host bridge initialization is started.
69	IOH DXE initialization.
6A	IOH SMM initialization.
6B~6F	Reserved.
70	PCH DXE initialization.
71	PCH SMM initialization.
72	PCH devices initialization.
73~77	PCH DXE initialization (PCH module specific).
78	ACPI Core initialization.
79	CSM initialization is started.
7A~7F	Reserved for AMI use.
80~8F	Reserved for OEM use (OEM DXE initialization codes).
90	Phase transfer to BDS (Boot Device Selection) from DXE.
91	Issue event to connect drivers.

Code	**Description**
92	PCI Bus initialization is started.
93	PCI Bus hot plug initialization.
94	PCI Bus enumeration for detecting how many resources are requested.
95	Check PCI device requested resources.
96	Assign PCI device resources.
97	Console Output devices connect (ex. Monitor is lighted).
98	Console input devices connect (ex. PS2/USB keyboard/mouse are activated).
99	Super IO initialization.
9A	USB initialization is started.
9B	Issue reset during USB initialization process.
9C	Detect and install all currently connected USB devices.
9D	Activated all currently connected USB devices.
9E~9F	Reserved.
A0	IDE initialization is started.
A1	Issue reset during IDE initialization process.
A2	Detect and install all currently connected IDE devices.
A3	Activated all currently connected IDE devices.
A4	SCSI initialization is started.
A5	Issue reset during SCSI initialization process.
A6	Detect and install all currently connected SCSI devices.
A7	Activated all currently connected SCSI devices.
A8	Verify password if needed.
A9	BIOS Setup is started.
AA	Reserved.
AB	Wait user command in BIOS Setup.
AC	Reserved.
AD	Issue Ready To Boot event for OS Boot.
AE	Boot to Legacy OS.
AF	Exit Boot Services.
B0	Runtime AP installation begins.
B1	Runtime AP installation ends.
B2	Legacy Option ROM initialization.
B3	System reset if needed.

Code	Description
B4	USB device hot plug-in.
B5	PCI device hot plug.
B6	Clean-up of NVRAM.
B7	Reconfigure NVRAM settings.
B8~BF	Reserved.
C0~CF	Reserved.

S3 Resume

Code	Description
E0	S3 Resume is stared (called from DXE IPL).
E1	Fill boot script data for S3 resume.
E2	Initializes VGA for S3 resume.
E3	OS S3 wake vector call.

Recovery

Code	Description
F0	Recovery mode will be triggered due to invaild firmware volume detection.
F1	Recovery mode will be triggered by user decision.
F2	Recovery is started.
F3	Recovery firmware image is found.
F4	Recovery firmware image is loaded.
F5~F7	Reserved for future AMI progress codes.

Error

Code	Description
50~55	Memory initialization error occurs.
56	Invalid CPU type or speed.
57	CPU mismatch.
58	CPU self test failed or possible CPU cache error.
59	CPU micro-code is not found or micro-code update is failed.
5A	Internal CPU error.
5B	Reset PPI is failed.
5C~5F	Reserved.
D0	CPU initialization error.
D1	IOH initialization error.

Code	**Description**
D2	PCH initialization error.
D3	Some of the Architectural Protocols are not available.
D4	PCI resource allocation error. Out of Resources.
D5	No Space for Legacy Option ROM initialization.
D6	No Console Output Devices are found.
D7	No Console Input Devices are found.
D8	It is an invaild password.
D9~DA	Can't load Boot Option.
DB	Flash update is failed.
DC	Reset protocol is failed.
DE~DF	Reserved.
E8	S3 resume is failed.
E9	S3 Resume PPI is not found.
EA	S3 Resume Boot Script is invaild.
EB	S3 OS Wake call is failed.
EC~EF	Reserved.
F8	Recovery PPI is invaild.
F9	Recovery capsule is not found.
FA	Invalid recovery capsule.
FB~FF	Reserved.

Regulatory Statements

Regulatory Notices

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In addition to high-efficiency performance, all GIGABYTE motherboards fulfill European Union regulations for RoHS (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) and WEEE (Waste Electrical and Electronic Equipment) environmental directives, as well as most major worldwide safety requirements. To prevent releases of harmful substances into the environment and to maximize the use of our natural resources, GIGABYTE provides the following information on how you can responsibly recycle or reuse most of the materials in your "end of life" product.

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GIGABYTE products have not intended to add and safe from hazardous substances (Cd, Pb, Hg, Cr+6, PBDE and PBB). The parts and components have been carefully selected to meet RoHS requirement. Moreover, we at GIGABYTE are continuing our efforts to develop products that do not use internationally banned toxic chemicals.

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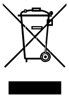
GIGABYTE will fulfill the national laws as interpreted from the 2002/96/EC WEEE (Waste Electrical and Electronic Equipment) directive. The WEEE Directive specifies the treatment, collection, recycling and disposal of electric and electronic devices and their components. Under the Directive, used equipment must be marked, collected separately, and disposed of properly.

WEEE Symbol Statement



The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly. With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.

FCC Notice (U.S.A. Only)

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a dealer or experienced TV/radio technician for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neither the Dealer nor the Manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

European Community Directive R&TTE Directive Compliance Statement:

This equipment complies with all the requirements and other relevant provisions of Directive 1999/5/EC of the European Parliament and the Council of March 9, 1999 on Radio Equipment and Telecommunication Terminal Equipment (R&TTE).

This equipment is suitable for home and office use in all the European Community Member States and EFTA Member States.

Taiwan NCC Wireless Statements / 無線設備警告聲明:

低功率電波輻射性電機管理辦法

第十二條: 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條: 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

低功率射頻電機技術規範

4.7: 在5.25-5.35秭赫頻帶內操作之無線資訊傳輸設備，限於室內使用。

Korea KCC NCC Wireless Statement:

5,25GHz - 5,35 GHz 대역을 사용하는 무선 장치는 실내에서만 사용하도록 제한됩니다。

Japan Wireless Statement:

5.2GHz帯 ~ 5.3GHz帯: 屋内のみの使用。

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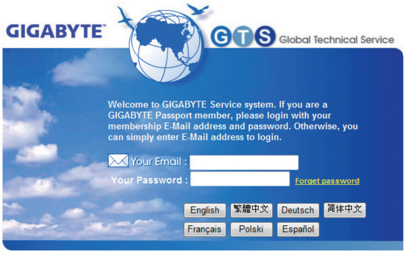
• GIGABYTE Global Service System



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